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The INDUSTRIAL-ARTS MAGAZINE

SEPTEMBER 1919

THE BRUCE PUBLISHING COMPANY
MILWAUKEE WISCONSIN

If You Were at the N. E. A. Summer Meeting

PEXTO TOOLS

What you saw and heard at the N. E. A. Summer Convention, at Milwaukee, must have accomplished one of two things.

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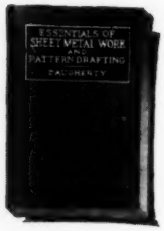

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PEXTO

SHEET METAL WORKERS' MACHINES & TOOLS

INDUSTRIAL-ARTS MAGAZINE

Vol. VIII SEPTEMBER, 1919 No. 9

FIRST AID TO THE INEXPERIENCED

I—Starting a Grade Class in Woodworking

S. J. Vaughn

SEPTEMBER is here again! Both teachers and pupils are breaking themselves away from vacations, summer schools, war work, etc., etc., and with varying degrees of confidence, satisfaction, misgiving, and alarm, are facing those first few September days when "trouble begins."

The teacher of little or no experience is squaring away and clearing decks for the "first engagement." The inexperienced teacher of manual training is perhaps perusing his note books, collecting "problems," rehearsing his part of the first recitation, and trying to imagine the first group of seventh or eighth grade urchins that present themselves to defy his skill, to try his patience, and to test his pedagogy.

If I were called upon to start beginning classes in woodworking, as I have been almost every year for the major part of the last twenty years, I should approach the task with a feeling that the success of my year's work very largely depended upon the outcome of my first contact with the classes. Hence, I should want to bring to the task every bit of assistance that advice, information, and experience could render. Every teacher of experience realizes fully that frequently a teacher has to struggle thru an entire year trying to overcome the complications and difficulties that arose out of indiscretions, misunderstandings, and misjudgments at the very first meeting of the classes.

In starting a class in woodworking, there are certain purposes to be achieved and certain principles to be observed. These will govern the procedure of any wise teacher. There are at least four big purposes in the first recitation of a class beginning woodwork.

1. To establish oneself and one's work in the respect and confidence of the class.

2. To give the class a start in a few fundamental operations of the work.

3. To impress the pupils with the worth-whileness of the work, to give them a notion of the character of it, and to arouse some enthusiasm for it.

4. To make definite plans for a succeeding lesson or group of lessons.

The first purpose mentioned is a vastly important one. The day of the driver and the scold has passed. The overwhelming majority of complaints and troubles and failures are due, not to a lack of mechanical skill, but to some personal faults or misfortunes of the teacher, or to an inability on the part of the teachers to establish a comradeship or goodfellowship with their pupils. I am compelled to confess that ninety per centum of all the troubles that an experience of 22 years has brought to me have been as largely due to my own faults as to those of the "troublesome boys" with whom I have had to deal.

Boys almost universally are actuated by a sincerity of purpose, a rationality of understanding, and a zeal for doing things that would do great credit to their elders.

A genuine respect, therefore, for the pupil and his opinion, whatever his station, is the first duty and privilege of every teacher and is the unfailing assurance of mutual understanding and respect. When one has established himself in the esteem and confidence of his pupils, he need have no fear that his suggestions concerning the work to be done will not meet with a hearty response. The highest compliment I ever had was paid me by a so-called "rough-neck" pupil of mine who solemnly and confidentially declared to a friend of mine that I was "some guy," and he would do anything I asked, and that he would stand by me until ice appeared where, if it ever had been, all reports had entirely failed to mention it. Those are not his words, but they convey something of his meaning and his enthusiasm.

A co-worker is infinitely more desirable and effective than simply a boss. Absolutely square and considerate dealing will break down opposition and compel co-operation. Teaching is very largely done by suggestion and inspiration rather than by command and court-martial. There comes a time, of course, in every school and in every class when the boss must show himself. A teacher who has enough self-control to be fair and considerate under trying circumstances, and enough self-respect to resent impertinence and imposition, will have enough self-assertion to dominate a critical situation when it arises. There is never any question among the members of a class as to who is really the boss. Either the teacher is or they are, and they know which it is. This conviction cannot be removed by boast or bluster or threat or any of the other make-believe rumblings of impending disaster. It cannot be prevented either by aloofness or by the assumption of a superior air that looks with disfavor and disapproval on all the work of the pupils and the efforts of the preceding teacher.

One of the brightest and best prepared young men of my acquaintance threw the boys of a whole community into open rebellion. When they were asked what grievances they had against the new teacher, all they could charge was, "Aw, he thinks we don't know nothin'." And there's a tip for the discriminating. Assume a certain amount of intelligence on the part of the class.

Another point that has an intimate and important bearing on one's professional standing and the establishment of the proper relations with classes, is one's attitude toward his predecessor. It is a very common fault among teachers to condemn the methods and the work of their predecessors. This disposition is the surest sign of a weak, selfish person. It is known among the psychologists as the "defensive reaction." Often such a person hopes to build up a defense for some of his own acts or to win some kind of approval or applause at the expense of another person who cannot be present to defend himself. It is an easy error to fall into and sometimes the temptation is great, because, being imperfect, everyone leaves behind him evidences of weakness and inefficiency of some sort. When one criticizes his predecessor, he really compares himself with his predecessor greatly to the disadvantage of the latter—a very undignified thing to do, because it amounts purely to self-flattery. So, if I were making a list of don'ts, I should place near the head of the list, "Don't criticize your predecessor."

Thus far, I have discussed the attitude and state of mind with which one should approach his task as a teacher and meet his classes for the first time. Assuming that the new teacher has had the discretion and good judgment to meet the pupils on an easy, informal basis of goodfellowship, his next task is to get the class busy at work at the earliest possible moment. There is a great diversity of opinion as to how this can best be accomplished and what the nature of the work should be. If one is working under a supervisor, who usually outlines the work and specifies the methods of procedure, my only advice is to take the supervisor's outline and specifications and undertake loyally and vigorously to carry them out.

"But," protests an ambitious young man, "what if one doesn't agree with the supervisor's methods?" My reply is that few people are wholly in accord with the theories and methods of their superiors in office. Most of us feel that we could handle the matter so much better than our superiors in authority. But since the responsibility of the system falls upon the supervisor, and since a certain unity is essential in any system, the proper attitude is one of absolute loyalty to the supervisor and a perfect obedience to the spirit of his wishes. When the new teacher has demonstrated his loyalty and his ability to get good results according to the supervisor's plans, he will very soon begin to be called into consultation for his opinion on various matters concerning the work. The chances are that before very long, the ambitious but loyal young man who disagreed with the methods of the supervisor will be given a free hand to work out his own ideas and methods. But he will get the free hand, if at all, by earning the complete confidence and respect of his superior in office thru the conscientious and uncomplaining carrying out of the work as laid down in the plans and specifications.

Where there is no supervisor and the inexperienced teacher is left to his own devices, it becomes quite a problem for him to decide what is best to do in order to get the class busy. There are several methods. One is based on the proposition that since the use of woodworking tools is one of the main elements in the course, the boys should begin at once a study of the tools. Hence, the first lesson is devoted to an examination and a discussion of tools and their uses. I have known several lessons at the beginning of the work to be spent in this manner. The pupils are given a list of the names of the tools, are told the various parts of the plane, etc., and are shown the methods of grinding and whetting edged tools, and are given explanations of the differences between the rip and the cross-cut saws, etc., etc. There are usually, of course, additional items in the lesson, but facts concerning tools constitute the bulk of the recitation.

Another method takes the same attitude toward lumber that the first takes toward tools. It assumes that since pupils are taking a course in woodworking, they should immediately be familiarized with woods of various sorts. Hence the time of the first lesson or lessons is taken up with a discussion of the various kinds of trees together with their methods of growth and their distribution. Lumbering from the time the tree is felled in the forest 'til the lumber is properly dried and piled in the factory ready for use, comes in for extensive treatment. Methods of sawing and curing, special uses, characteristics, and values of lumber receive their share of consideration.

A third method disregards, in the first lesson, the material used in the other two methods, and devotes the time to discussing and planning the projects to be undertaken and to making detailed working drawings for use in their construction.

All three of these methods seem to me to be faulty in the following particulars:

1. They make the first lesson in manual training essentially like the regular academic work of the school.
2. They undertake to cram the mind with a lot of unrelated and meaningless information which cannot be retained and which should be acquired gradually as needs arise in the work. And they undertake to do it when the boys' minds are all prepared for a new and different type of work.
3. They ignore the attitude and interest of the boys who constitute the class.

The first and strongest attraction that manual training has for boys is the idea that it is different from the ordinary work of the school, that it deals with activities and materials outside of the usual category of school work. The impelling thing that urges a boy toward a shop is that it is a place where vigorous activities are going on and where each person is doing things.

It is not of primary importance that before a boy does any work with a plane he must know that it consists of so many parts and that each part is called

so-and-so. Neither is it absolutely essential in the very beginning of work with wood that a boy should know the different kinds of trees, the kind of lumber produced by each, and the characteristics and uses of the various kinds of lumber. These matters of information are very important and, of course, manual training classes must know them, but they are much more effectively learned if learned in relation to definite needs and uses and problems as the work progresses thru the year.

In the case of necessary or desirable information which is essentially academic in character, like the study of wood, a manual training teacher may usually arrange to have the regular teachers co-operate with him in the teaching of such material and thus save valuable time for the shopwork proper.

It should not be lost sight of that the time allowance for shopwork is grossly inadequate and that one of the main reasons for shopwork in the elementary school is that it affords the motor side of education. Hence, the time set aside for shopwork should be as fully as possible devoted to the kind of work characteristic of the shop, namely, actual constructive tool work.

Method Recommended.

My own practice, based upon long, varied experience and wide observation, is to put the boys immediately to work with the tools at the benches after a brief preliminary statement and a very short demonstration. The preliminary statement concerns the selection or assignment of benches and the purpose of the work for the day as a tryout or experiment to familiarize them with the shop, the tools, and the beginning operations of woodworking.

The short demonstration consists of the four steps necessary in squaring up the sides and edges of a piece of lumber. In making the demonstration, I put the blade into the plane in the presence of the class and call attention to the methods of adjustment as the adjustments become necessary in the progress of the work.

At the conclusion of the statement and demonstration, and within ten or fifteen minutes of the beginning of the lesson, the boys are sent to their respective benches where pieces of basswood, poplar, or white pine about 1x3x10 have been placed and where sharpened and adjusted planes await them. The boys proceed to the attempt at squaring up the stock according to the demonstration, while the teacher moves among them observing their efforts, testing their work, and giving assistance wherever needed. This continues for thirty or forty minutes, assuming that two 45-minute periods are to be devoted to the lesson.

The question immediately arises as to what is to be made of the blocks of wood. I worried over that question for years, for my theory was and is that everything must serve some useful purpose. I tried giving all sorts of suggestions as to the things that boys would care to make the first day from those first pieces. I tried sandpaper blocks, key racks, and numerous other things, but no one of them ever seemed to appeal to the interest of the class any more than the simple experiment on the pieces of stock. It seems that just the new experience of coming to the shop and beginning the actual work with the tools is sufficient to hold the interest at high pitch thru this first period. Hence, I have frankly said it was a practice piece and whatever happened to it was a matter of little consequence so long as they did their best and showed me what quality of work to expect of them.

The success of this part of the lesson depends upon the teacher and the spirit he has been able to arouse in the boys. Any plan must always be subject to the modifications of this personal element. A plan that seems entirely successful for some teachers is impossible for me, so my suggestions must always be judged with this consideration in mind, but I think this observation rests on a sound basis.

At the end of the thirty or forty minutes of practice on this preliminary problem, the work at the benches is stopped, the class is called together, and plans for the future work are discussed. In this the teacher attempts to make the work seem attractive and worthwhile by outlining what it is possible to do during the year and by emphasizing the fact that they are entering the realm of men's work.

Finally the question is taken up as to what the class will do the next time they come to the shop. I simply announce to my classes that the project for the next work will be so-and-so, whatever I have decided to start them on. In one class it may be camp stools, in another bird feeding stations, in another, pairs of stilts; in another, sail boats, etc., etc. My contact with the pupils will undoubtedly help me to adapt the projects to the classes. The projects are selected with the idea of meeting certain recognized interests in boy life; of furnishing the need for a few of the simpler tool operations, and of providing work that can be reasonably well done by that particular grade of pupils in a limited time and at moderate cost. If anyone has given you theoretical courses based on the idea of sequential tool processes," try to forget and forgive; there aren't any such things. Failure stares anyone in the face who attempts to inflict such nonsense on suffering boyhood.

When the project has been announced, the boys are set to work planning the details of size, shape, and methods of construction. A very brief freehand sketch and working drawing are made and the dimensions are indicated. Thus the class is ready for the next visit to the shop. The time for dismissing the class will probably have arrived by the time the planning is completed. If not, the boys will gladly return for a time to the squaring up problem already started, or if any have finished, which is doubtful, they could try their hands at a sawing exercise on the squared up stock.

By such a first recitation as here outlined, the following purposes have been met:

1. The proper relations have been established between pupils and teachers.

2. The strongest temporary interest of the boys has been satisfied by putting them immediately to work with the tools.

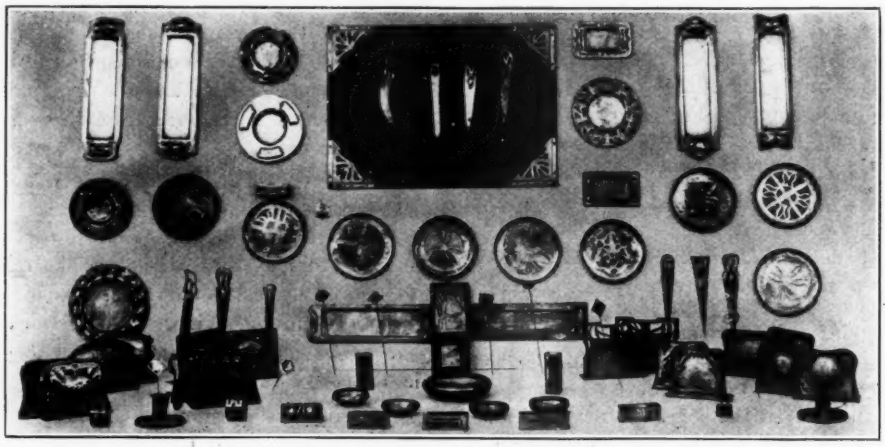
3. The class has been familiarized with the proper methods of handling the plane, the trysquare, and the marking gauge.

4. The fundamental operations of squaring up stock have been taught.

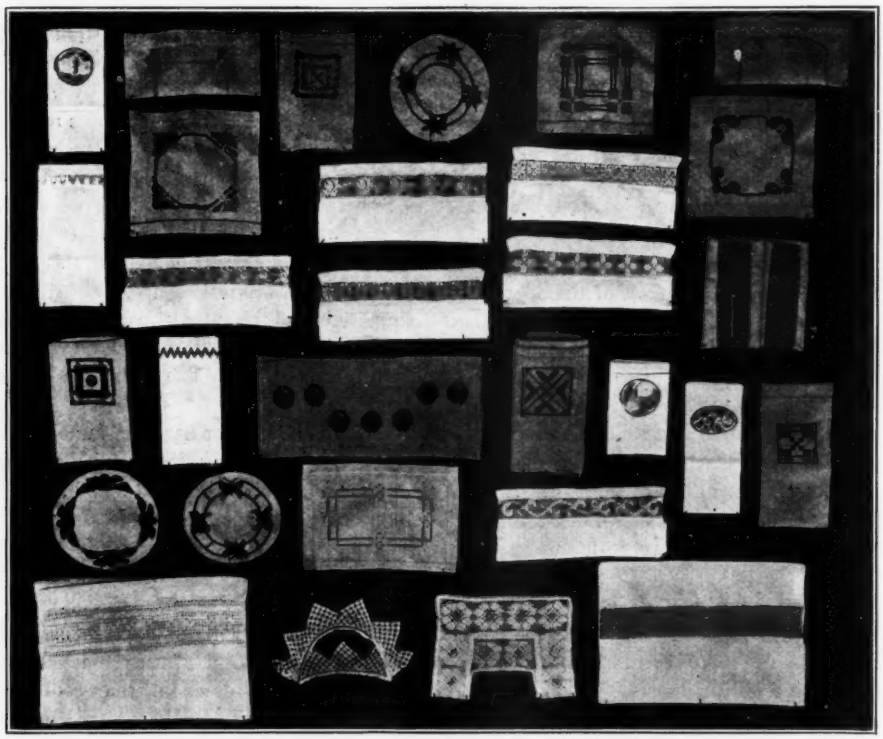
5. The teacher has been able to give the boys some insight into the possibilities of the year's work and some enthusiasm for it.

6. The method of planning a project for future work has been given, and by this method the boys have laid out the task for their next lesson.

Note.—This is the first of a series of articles by Mr. Vaughn. The second, which will appear in October, will take up "The Assignment and Planning of Projects." Further articles will be published during the year.—*The Editors.*



METAL WORK BY EIGHTH GRADE BOYS, JOLIET, ILL.
Mr. L. Day Perry, Supervisor of Manual Arts.



EXAMPLES OF APPLIED ART WORK AND SEWING BY SEVENTH AND EIGHTH GRADE GIRLS, JOLIET, ILL. Miss Laura Avery, Supervisor of the Household Arts Department.

WHAT MINNEAPOLIS IS DOING ALONG THE LINE OF VOCATIONAL GUIDANCE

Bertha Van Hove, Acting Director, Minneapolis Vocational Bureau

THE purpose of the program for Vocational and Educational Guidance in the Minneapolis Public School System, that is being developed by Supt. B. B. Jackson, is to secure better distribution of opportunity. The result of unequal distribution of opportunity stares us in the face when we look at the figures obtained from the registration of men, 21 to 31 years of age inclusive, in Minneapolis during the first draft. Out of a total of 41,040 one per cent had completed four years of university work. Eight and a half per cent of them had four years of high school work. Only one-third of them (thirty-two and a half per cent) had completed the eighth grade. Sixty-two and a half per cent had completed less than the seventh grade.

The two chief reasons for early withdrawal from school appear to be economic pressure and lack of interest in the subject matter taught. Hence the adjustment which will occur in our economic system to eliminate the necessity for early withdrawal from school for economic pressure must be supplemented by modifications of school methods or programs in order to meet the needs and interests of all.

The Minneapolis ideal is to keep children in school, to adjust school programs to meet the needs of all, and when they must go to send them forth with open eyes.

The machinery for keeping children in school for the compulsory school age has been in motion since 1914, namely the school census and attendance divisions.

In the school census division one worker is kept in the field to make a continuous house-to-house canvas for the enumeration of children up to the age of eighteen years. Special attention is placed on combing the congested and rooming-house districts where there is much shifting. The school principals are encouraged to secure information. The census is also amended daily by an office force that records lists of newly admitted pupils, transfers, withdrawals, and re-instated pupils. They make the annual enumeration for the state superintendent of schools: (1) by age, (2) by sex, (3) by school. They stand ready to give information to bona fide organizations outside of the city in regard to age, nationality, and distribution of the children by block.

For example, recently when the administration wished to know where to locate a school, a map was made showing how many children of school age were in each block in that community. When the Park Board wished to locate a park near a congested district, a map was made for them so they could tell by block where the children were located.

The attendance officers in Minneapolis are not cast-off policemen who are too old for their beats. They are women qualified to teach, who have had additional training for social work. They do not think truancy is due to a child's depravity but rather to the fact that there is something lacking in the home or in the school. It may be lack of parental supervision, lack of proper food or clothing, lack of interest in the education offered. After the attendance officer has located the apparent cause for the irregular attendance she proceeds to see if the cause can be eliminated. The family may be in need of the assistance of a nurse, a visiting housekeeper, an explanation of the compulsory education and the child labor laws or a mother's pension.

The attendance officer is the intelligent, resourceful extra-parent making use of what the community has to offer her in her effort to secure for the child what the home or the school lacks so that regular attendance may be obtained. Poverty and lack of opportunity breed irresponsibility and vice, hence there are some children who are, thru court action, removed from their home environment and given another chance in Glen Lake Farm School for Boys or in the Hennepin County Home School for Girls.

Those whose irregular attendance seems due to lack of interest in subject matter are given another chance either in a junior high school where there is more industrial work and promotion by grade rather than by class, or in some opportunity class where smaller groups of children receive individual attention.

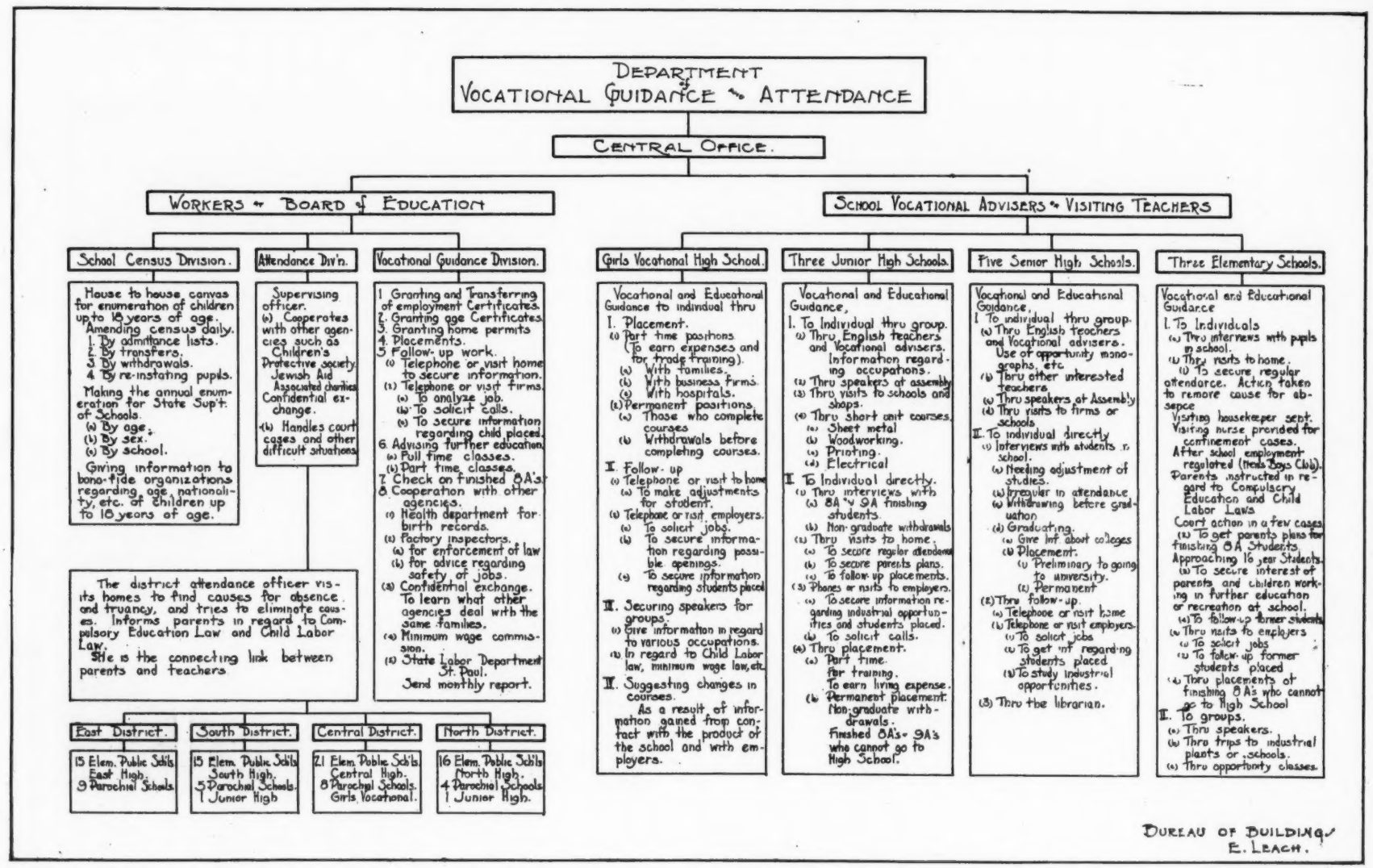
The attendance officers verify the withdrawals and checks on the transfers. They serve the parochial and private schools indiscriminately.

Passing from the machinery at work for keeping children in school during the period of compulsory age, let us consider the machinery which is designated to serve those who leave the moment they have completed the minimum set by law: namely, 14 years of age and completion of the eighth grade or sixteen years of age.

All the children under sixteen years of age entitled to and desiring employment certificates pass thru the Vocational Guidance Division of the central office of the board of education. No child is granted an employment certificate until an effort has been made to retain him in school.

The physical nearness of the health department where births can be verified, the hygiene department where the physician gives the required physical examination and the factory inspector who enforces the child labor laws and advises in regard to the safety of jobs—makes it possible to reduce the delay to a minimum. The occasional impatient parent who rebels at what he designates red tape in order to secure an employment certificate need only go to a city like Chicago in order to learn to appreciate the advantage of the close physical location of these departments.

The women thru whose hands these children pass to their first jobs are not untrained clerks nor ignorant politicians as in the case in some cities—they are mature intelligent women who are first teachers, then trained


DEPARTMENT of VOCATIONAL GUIDANCE & ATTENDANCE
CENTRAL OFFICE.
WORKERS ~ BOARD of EDUCATION
SCHOOL VOCATIONAL ADVISERS & VISITING TEACHERS
School Census Division.
House to house canvas for enumeration of children up to 18 years of age.
Amending census daily.
1. By admittance lists.
2. By transfers.
3. By withdrawals.
4. By re-instating pupils.
Making the annual enumeration for State Sup't. of Schools.
(a) By age.
(b) By sex.
(c) By school.
Giving information to bona-fide organizations regarding age, nationality, etc. of children up to 18 years of age.
Attendance Div'n.
Supervising officer.
(a) Cooperates with other agencies such as Children's Protective society. Jewish Aid Associated charities. Confidential exchange.
(b) Handles court cases and other difficult situations.
The district attendance officer visits homes to find causes for absence and truancy, and tries to eliminate causes. Informs parents in regard to Compulsory Education Law and Child Labor Law.
She is the connecting link between parents and teachers.
Vocational Guidance Division.
1. Granting and Transferring of employment Certificates.
2. Granting age Certificates.
3. Granting home permits.
4. Placements.
5. Follow-up work.
(a) Telephone or visit home to secure information.
(b) Telephone or visit firms.
(a) To analyze job.
(b) To solicit calls.
(c) To secure information regarding child placed.
6. Advising further education.
(a) Full time classes.
(b) Part time classes.
7. Check on finished 8A's.
8. Cooperation with other agencies.
(a) Health department for birth records.
(b) Factory inspectors.
(a) for enforcement of law
(b) for advice regarding safety of jobs.
(c) Confidential exchange. To learn what other agencies deal with the same families.
(d) Minimum wage commission.
(e) State Labor Department St. Paul.
Send monthly report.
East District.
15 Elem. Public Sch'ls. East High. 9 Parochial Schools.
South District.
15 Elem. Public Sch'ls. South High. 5 Parochial Schools. 1 Junior High.
Central District.
21 Elem. Public Sch'ls. Central High. 8 Parochial Schools. Girls Vocational.
North District.
16 Elem. Public Sch'ls. North High. 4 Parochial Schools. 1 Junior High.
Girls Vocational High School.
Vocational and Educational Guidance to individual thru
I. Placement.
(a) Part time positions (To earn expenses and for trade training).
(a) With families.
(b) With business firms.
(c) With hospitals.
(b) Permanent positions.
(a) Those who complete courses
(b) Withdrawals before completing courses.
II. Follow-up
(a) Telephone or visit to home
(a) To make adjustments for student.
(b) Telephone or visit employers.
(a) To solicit jobs.
(b) To secure information regarding possible openings.
(c) To secure information regarding students placed.
III. Securing speakers for groups.
(a) Give information in regard to various occupations.
(b) In regard to Child Labor law, minimum wage law, etc.
IV. Suggesting changes in courses.
As a result of information gained from contact with the product of the school and with employers.
Three Junior High Schools.
Vocational and Educational Guidance,
I. To Individual thru group.
(a) Thru English teachers and Vocational advisers. Information regarding occupations.
(a) Thru speakers at assembly
(b) Thru visits to schools and shops.
(c) Thru short unit courses.
(a) Sheet metal
(b) Woodworking.
(c) Printing.
(d) Electrical
II. To Individual directly.
(a) Thru interviews with
(a) 8A's & 9A finishing students.
(b) Non-graduate withdrawals
(b) Thru visits to home.
(a) To secure regular attendance
(b) To secure parents plans.
(c) To follow-up placements.
(c) Phones or visits to employers.
(a) To secure information regarding industrial opportunities and students placed.
(b) To solicit calls.
(d) Thru placement.
(a) Part time.
For training.
To earn living expense.
(b) Permanent placement.
Non-graduate withdrawals.
Finished 8A's- 9A's who cannot go to High School.
Five Senior High Schools.
Vocational and Educational Guidance,
I. To individual thru group.
(a) Thru English teachers and Vocational advisers. Use of opportunity monographs, etc.
(b) Thru other interested teachers.
(c) Thru speakers at Assembly
(d) Thru visits to firms or schools
II. To individual directly
(a) Interviews with students in school.
(a) Needing adjustment of studies.
(b) Irregular in attendance
(c) Withdrawing before graduation
(d) Graduating.
(a) Give inf about colleges
(b) Placement.
(a) Preliminary to going to university.
(b) Permanent
(c) Thru follow-up.
(a) Telephone or visit home
(b) Telephone or visit employers.
(a) To solicit jobs
(c) To get inf regarding students placed.
(d) To study industrial opportunities.
(3) Thru the librarian.
Three Elementary Schools.
Vocational and Educational Guidance
I. To Individuals
(a) Thru interviews with pupils in school.
(b) Thru visits to home.
(a) To secure regular attendance. Action taken to remove cause for absence
Visiting housekeeper sent.
Visiting nurse provided for confinement cases.
After school employment regulated (Neds Boys Club).
Parents instructed in regard to Compulsory Education and Child Labor Laws
Court action in a few cases.
(b) To get parents plans for finishing 8A Students.
Approaching 16 year Students.
(c) To secure interest of parents and children working in further education or recreation at school.
(d) To follow-up former students.
(c) Thru visits to employers
(a) To solicit jobs
(b) To follow-up former students placed
(d) Thru placements of finishing 8A's who cannot go to High School
II. To groups.
(a) Thru speakers.
(b) Thru trips to industrial plants or schools.
(c) Thru opportunity classes.
BUREAU OF BUILDING
E. LEACH.

ORGANIZATION OF THE VOCATIONAL GUIDANCE DEPARTMENT OF MINNEAPOLIS SCHOOLS.

social workers. Women who can present the value of education to parents and children—women who keep in touch with the best juvenile jobs that can be found for such children.

These women are ready to extend the helping hand again when the youngster goes from his first juvenile job to the second or third. Whenever the child changes employers, the employment certificate must be returned to the board of education and transferred to the new employer.

The woman at the head of this division makes careful job analyses. These are used by the vocational advisers in connection with the opportunity monographs sent out by the Federal Board. The workers in this division check on all finished eighth grade students who did not enter high school. Thru a visit to the home the child is induced to enter some school or to secure a home permit or an employment certificate as the situation may require.

Next we must consider the machinery provided for giving vocational and educational guidance to those who remain in school longer than the minimum required by law.

The opportunity rooms for students needing individual attention have been mentioned. In addition, short unit courses are offered in the junior high schools where boys can try themselves out at sheet metal, printing, woodwork and electrical work. This provocational work may enable them eventually to choose vocations more wisely or it may serve to stimulate their interest in academic work because they see its relation to the shop work which they desire.

The Girls' Vocational High School in which short unit courses prepare girls for telegraphy, junior-nursing, stenography, dressmaking, cooking, etc., is the means of retaining many girls in school who would not remain in the regular senior high schools. No courses in the Girls' Vocational High School extend beyond two years.

There is a conscious determined effort on the part of the administrative heads to make all adjustments necessary in the school curricula to meet the needs of the many instead of the few. Senior high schools too are induced to offer short courses in shop work, called "job courses," which are designed to meet the needs of the group that usually drop out of high school soon after entering.

This wider opportunity for children which is secured by the changes in school programs is supplemented by a group of workers called vocational advisers or visiting teachers. They are at present employed in all senior high schools, in three junior high schools, in three elementary schools and in the girls' vocational high school.

Fourteen full time workers are employed at salaries ranging from $1000 to $1800 a year. These workers have, with a few exceptions, had training in social work or in courses in vocational guidance in addition to their teaching experience. In dealing with individual students seeking adjustments they have no short-cut methods of estimating a student's latent possibilities. They do not pose as experts in character analysis. They obtain the student's own statement of his interests and his plans, talk with the parents, secure their plans for their child and their estimate of his ability; the teachers' opinions are also obtained; and when this information is pooled the vocational adviser brings to the parents and to the child the information in regard to the courses desired or the occupations in which the child expresses an interest.

It should not be inferred that the vocational advisers are informed in regard to all occupations. They give much general information and some specific information and can direct the students to librarians, or to business men or women who are informed. However imperfect this may be, it is certain that the vocational advisers do contribute much information which makes it possible for the parents and student to make a choice of school work or of an occupation more intelligently.

Vocational and educational guidance to the individual reaches only a limited number: (1) those who come to ask advice of their own accord, (2) those who are referred by teachers or principals because some unusual situation has arisen. It may be irregular attendance, lack of interest, or low grades, a display of special aptitudes, or unusual ability; need for part time employment, or contemplated withdrawal from school either before or at graduation. There are many other children who do not come within this classification who are reached only in groups.

The accompanying chart shows that in all types of schools, speakers are provided to present opportunities for future education in high schools or to present opportunities in some specific occupations. The task of finding a man or woman informed in regard to some leading occupation has not been found as difficult as it has been to find one informed and at the same time able to present the information in such a way that young students comprehend and retain it. Only two English teachers have thus far made a definite effort to study occupations in connection with their English work. Essays, discussions and debates have resulted in widening the students' interest and in increasing their fund of information. It is readily seen that the same information which may result in vocational guidance for one child will help to increase another child's fund of general information and be for him a liberalizing influence.

In two instances the vocational advisers themselves conduct classes in vocational information. In some schools the vocational advisers or visiting teachers with the assistance of their principals have been especially successful in interesting teachers in home visiting, others have found teachers willing to give information in regard to the occupations related to the subject-matter taught. One general science teacher gave her class of girls a vision of the opportunity for girls as

bacteriologists, food chemists, textile chemists and dietitians.

Placement is a phase of vocational guidance that is considered of importance for school children who must earn their living expenses and for practical trade training. More of this part-time employment is carried on at the girls' vocational high school than elsewhere. The junior nurses, sales girls, and home-makers get additional training in connection with their school training by going to homes to cater, to care for children, or to sell in department stores. The permanent placements made for withdrawals beyond the compulsory age are rare except for graduates. The non-graduates usually have jobs when they present themselves for dismissal. It is then too late to do much constructive work with them other than to give them a somewhat broader basis for judging a job than by the initial wage. An effort is made to have them see that a growing efficiency in connection with a growing responsibility, as well as a living wage is what makes a job really worth while.

These various phases of vocational guidance—(1) studying various occupations, (2) estimating the student's ability and his latent possibilities, (3) extending aid in choice of courses, (4) the modification of school curricula and practices, (5) placement and follow-up,—are as has been stated before for the purpose of distributing opportunity to larger groups of children.

We have made a beginning but there remains much still to be done. We need more men to develop the work with the boys. We need the assistance that a psychologist can give. His gradation of the student's ability pooled with the parents', teachers', child's, and advisers' estimates would be a valuable contribution.

We need short unit courses in economics and civics which all boys and girls should be required to take so that, whenever they leave, they will go forth alive not only to the economic value of their work to the community and to themselves individually, but alive also to the fact that in order to succeed in their jobs they are also dependent on good government,—good government manifesting itself in just taxation, equal opportunity before the law, reliable sources of information; wholesome recreational facilities; and the elimination of economic injustices.

THE GRAPHIC METHOD

Dean G. Carter, Iowa City, Ia.

The use of curves, charts and diagrams as a means of illustration is increasingly used in various forms of printed matter. These "Graphic Illustrations" are found in census reports, year books, bulletins, lantern slides, and charts. Current magazines, books, and advertising literature use this method of representation to bring out facts.

The reason is that the graph or pictorial illustration can be read and understood almost at a glance. A picture is on the page and easily impressed upon the mind of the reader. Naturally to most readers, an illustration is more attractive and interesting than a table of results, or a column of figures.

The value of curves for engineering work has been recognized, and after completing such a course, the student will in a general way, be able to plot results graphically. To the engineer the value of the curve is that it gives averages; checks unusual results with the normal; and brings out important principles.

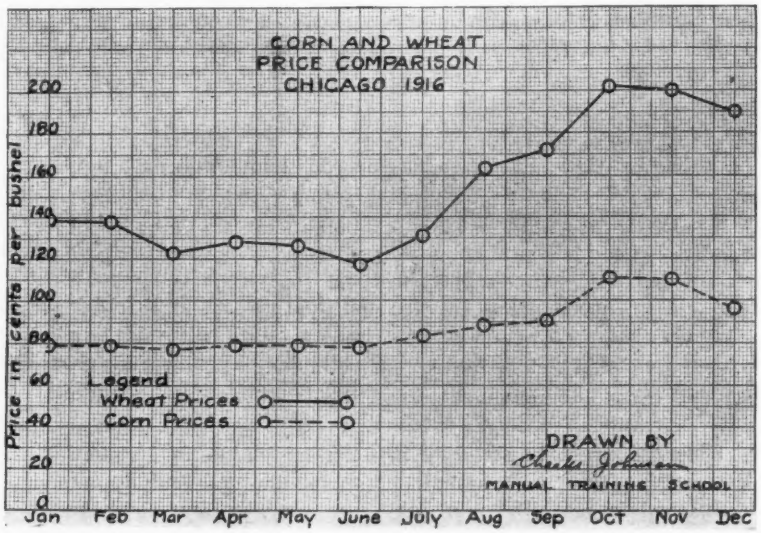


FIG. 1.

The student of high school and college age will

encounter in his reading a great number of graphs, some of which might well be improved upon. If he has something to say in printed form, he may wish to illustrate certain principles with graphs. If the student lives on a farm, he will study the curves of corn and hog prices, and market variations; the cost of producing and marketing crops, and the distribution of labor, all of which are discussed graphically in the farm press, and in agricultural bulletins. The student preparing himself for business will read and study the curves of market fluctuation, or observe the curve of the salesman's progress. In industry he will deal with cost curves, production, efficiency, and the like.

The object of this article is to discuss "Graphic Methods" as a study for high school, or college freshmen students, and show how the graph in its common forms may be adapted to agricultural and industrial uses.

Because the time allotted to the study of a course in graphics would of necessity be rather brief, it would not be desirable to go deeply into the theory of the subject, nor to attempt to construct the more complex forms of graphs. Among the forms which could not be studied are the shaded maps, which show rainfall; crop production; yields; and population, tho the government literature makes free use of the above form. Neither could a study be made of the commercial geography illustrations, which show world shipping tonnage, by a series of ships of varying size, or the population of principal countries by figures of men, or meat production by pictures of animals. Illustrations of this latter type may be misleading, because the thickness of the figure does not usually show on the page, and the true volume comparison cannot be made.

Six years ago a course in Graphic Methods was established by the late Professor Costelloe, in the Department of Agricultural Engineering, at Iowa State College. It is required by freshmen agricultural students.

In the rather brief time of 36 hours allotted to this subject it was the object of the course to enable the student to make drawings that correctly illustrated the data at hand; to put the data in a neat and attractive form; to correctly interpret graphs; and to avoid exaggerated or misleading illustrations.

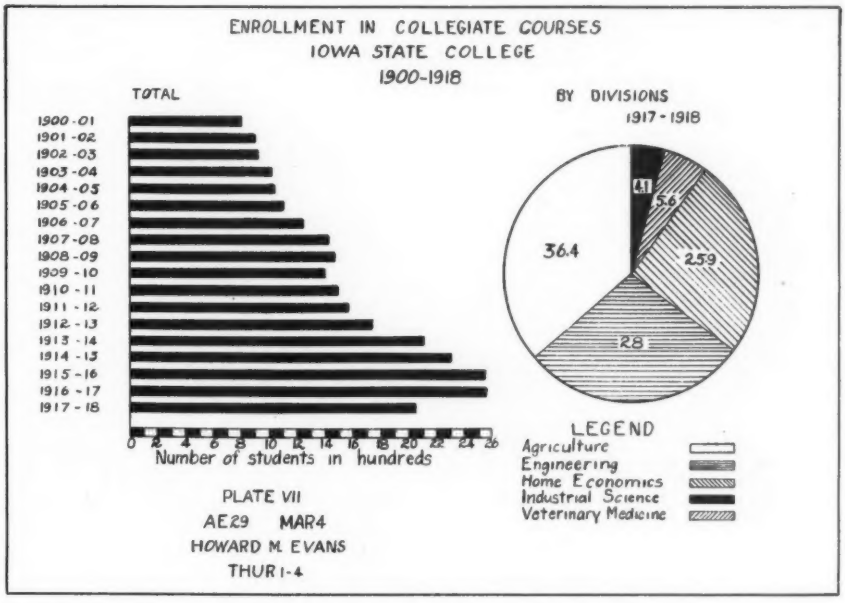


FIG. 2.

Our course not only instructs the student in the above principles, but because of the nature of the freshman course it is necessary for us to instruct the student in freehand lettering, the use and care of drawing instruments, and enough principles of mechanical drawing to enable the student to put out the work in neat and attractive shape. Three common and quite accurate methods of graphics are given. They are the curve, bar diagram, or column, and the "pictogram" or circle.

The curve in engineering work, is a smooth regular line drawn through the average of the points, and shows general facts. In our work it is a broken line curve, for the reason that there is no average law governing prices for a certain month, or weather conditions, or production. The most accurate method is to plot the curve as shown in Figure 1. Of course, a great many curves of rainfall, for example, plotted for the months of the year will show the general tendency, which might be shown by a smooth curve. This requires too much time, however, to give in a short period.

Along the bottom of a sheet of cross-section paper the element of time is scaled, allowing equal spaces for equal periods of time. In the other direction, the ele-

ment of quantity is scaled vertically, beginning with zero at the bottom of the sheet. The intersection of any date line with its corresponding quantity gives one point on the curve. All given values plotted give a series of points, which, when connected, form the curve. One curve on a sheet shows variation, two or more curves form a comparison, and show relations.

In plotting curves, emphasis is placed upon giving equal space to equal intervals of time or quantity. Zero of the quantity scale must be shown on the bottom line, since we unconsciously consider the lowest line as the starting point. The scale must have an explanation easily read, and all lettering must be well balanced. When there is more than one curve on a sheet, each should be drawn with a different type of line, then a legend or key used, which explains this, and tells what each line represents.

The bar diagram or column is used to show a comparison between items, by means of a bar drawn to scale, where the element of time does not occur, or where the points of time are so few that there would not be enough points to make a good curve. Or possibly for the sake of appearance, the bar might be preferred to the curve. This method may be used to compare the number of motor trucks in use now, with the number of five years ago; to compare the time required to do a piece of work by hand and by machine. Bars should be shaded, to make them show up well. The first part of Figure 2 shows this.

The pictogram or circle is used to show a percentage comparison, and may best be used to divide any quantity into various subdivisions or percentages. An example of this is the tonnage carried by United States railways. The total is divided into such parts as farm produce, forest products, mine products, manufactured goods, and local shipments. The method is as follows: The circle of 360 degrees is taken as 100 per cent. Suppose that forest products included 25 per cent of the tonnage. This would be one-fourth of the circle or 90 degrees. Each other division would likewise be shown as a segment of the circle, and each shaded for contrast. Shade lines are preferably cross-hatch lines at 45 degrees, full, dotted or dash lines in each direction. In some cases water colors, or colored pencils might be used, but for our work, we prefer pen and ink lines.

In all plates emphasis is placed on lettering. If cross section paper is not used, guide lines for all letters should be drawn. We use vertical letters for several reasons. The student has very few hours for practice. The principal lettering is, moreover, title work. Since part of the plates are on cross section paper, the vertical lines will serve as a guide for the letters.

Work of the nature described above might, I believe, be profitably given with a course in manual training. Two or three plates of graphics could be given along with mechanical drawing. While not fitting the student as an expert in graphs, it will be of interest, and the student will gain some proficiency in the subject. To derive the greatest good, material of interest to the class must be used. Whether it be agriculture, the trades, or whatever the field, much material of particular interest is available.

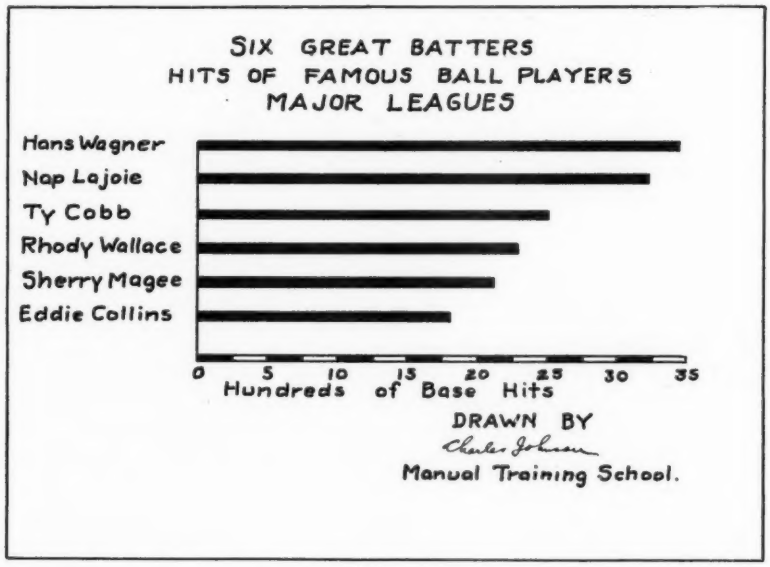


FIG. 3.

For the boy whose interest lags in the work of such a course, there are individual interests of his own which may be graphically represented and studied. For instance a boy intently interested in baseball would be attracted by material illustrated in Figure 3, which shows a comparison of hits made by Hans Wagner, Ty Cobb, and other great players. Data from the athletic page will illustrate the principles of graphics as well as the year book or census figures of 10 years ago.

The course at Iowa State College is given in a three hour period, thru a term of twelve weeks. Six hours are devoted to freehand lettering practice and exercises. Following this are three curve plates, each a little more complex than the preceding one. This requires about nine hours. Two periods each are given to the bar diagram and percentage comparison, and following this a few plates are given, using two or three methods of illustrating the same data.

Following is a list of plates required in the course in Graphic Methods at Iowa State College:

Plate No. 1—Freehand Lettering.

Plate No. 2—1 curve—Population of Iowa.

Plate No. 3—2 or 3 curves. Corn price comparison.

Plate No. 4—3 curves. Corn; hogs; and crop conditions.

Plate No. 5—Pictogram. Tonnage carried by Railroads.

Plate No. 6—Bar Diagram. Livestock market.

Plate No. 7—Combination plate. College Enrollment.

Plate No. 8—4 curves, cross section lines made by student.

The Textile Industries in Elementary Education

Leon L. Winslow, State Specialist in Drawing and Industrial Education, Albany, N. Y.

THE elementary school needs no introduction to the processes of simple weaving. To the casual observer who has been accustomed for years to see schoolroom windows piled high with little wooden frames, commonly dignified by the name of loom, this statement would indeed seem to be true. Elementary education may need no introduction to the processes of simple weaving, but it does need to cultivate a more intimate acquaintance with the textile industries which each little loom typifies or should typify in all serious minded and well regulated school systems. Children are taught all too little regarding the great industry involving carding, spinning and weaving. Let us first consider the *content* side.

Carding and Spinning.

When man first began to think of interlacing reeds to form a mat, he also thought of using smaller fibers rudely twisted together, in place of larger strands. It at once became evident that a rope of twisted fibers would be stronger than a single fiber of equal diameter, and so there was really an advantage in using the many small fibers twisted together. Of course the strength of a rope depends also upon the quality of the fibers entering into its construction.

In the most ancient of times, it is likely that the fibers used in making strands, were straightened out or *carded* by hand, with the aid, later on, of a board full of spikes, and spun by twisting them together between the thumb and finger, or by rolling them between the palms of the hands. Since it was difficult to handle a mass of straightly carded fibers without disarranging them, it became the custom to wrap them lightly about a stick, called a *distaff* and to fasten them in place on this by tying.

The process of spinning fibers with the fingers was very laborious, so people began in very early times to use the *spindle,* socalled because it spun around when used, as an apple would spin if hung on the end of a long cord.

The spinner would fasten the distaff in her belt or under her arm and, drawing out a few fibers, she would twist them slightly and fasten them in a cleft in the end of the cylindrical wooden spindle. Then giving the spindle a twirl, she would keep pulling out fibers, while the weight and motion of the suspended spindle would stretch and twist the fibers into a smooth, even thread. When the spindle slackened its whirling and stopped, if left alone, it would reverse on account of its weight, and untwist the thread. To prevent this, the spinner either gave the spindle an additional twirl in the proper direction, or if the thread was long enough, she wound it around the body of the spindle and again fastened the string in the cleft end, thus going on with the process.

The next radical change in spinning was brought about at the time of the introduction of the socalled *great wheel,* the large Colonial spinning wheel familiar to all. It consisted of a shaft, set horizontally, on one end of which was a little pulley, on the other, a spindle, all belted to a large wheel, which was whirled by hand or by means of a foot treadle. The operator of this great wheel fastened her distaff of carded fibers into her belt and, pulling out a few of the fibers, she twisted them and fastened them in the cleft end of the horizontal spindle. Then causing the large wheel to revolve she fed out the carded fibers and backed away from the revolving spindle in the direction in which the spindle pointed. When the thread was twisted sufficiently, she stopped the machine. Then in order to keep the spun thread from unwinding, she wound it on the spindle. To do this, she walked around until the thread was at a right angle with the spindle, and slowly turning the wheel, she guided the thread on the turning spindle and wound it up. Next, she tucked the end of the thread back in the cleft end of the spindle, and feeding more fibers, continued the process of spinning and winding until the spindle was full of spun yarn. Then she would wind the yarn off by means of a reeling device into a bundle, called a skein.

We can see that the quality of yarn turned out depended most entirely upon the skill of the spinner. If

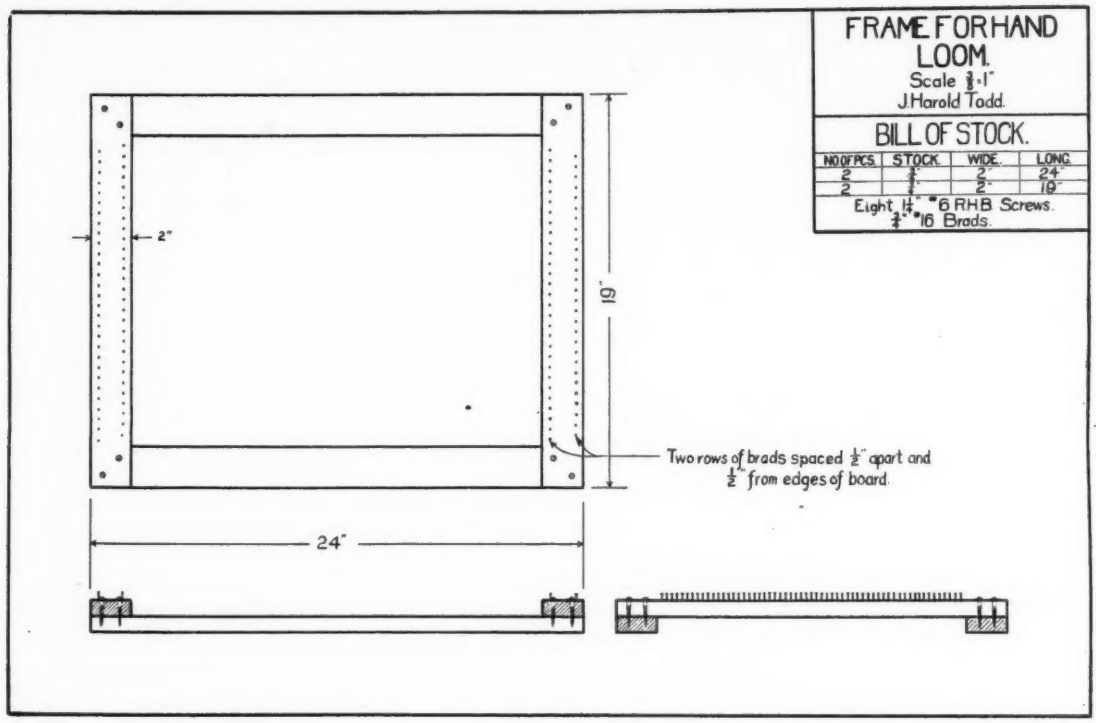

FRAME FOR HAND LOOM.
Scale ½"=1"
J. Harold Todd.
BILL OF STOCK.
NO. OF PCS. | STOCK. | WIDE. | LONG.
2 | ¾" | 2" | 24"
2 | ¾" | 2" | 19"
Eight 1¼" #6 R.H.B. Screws.
¾" #16 Brads.
2"
19"
Two rows of brads spaced ½" apart and ½" from edges of board.
24"

FIG. 1.

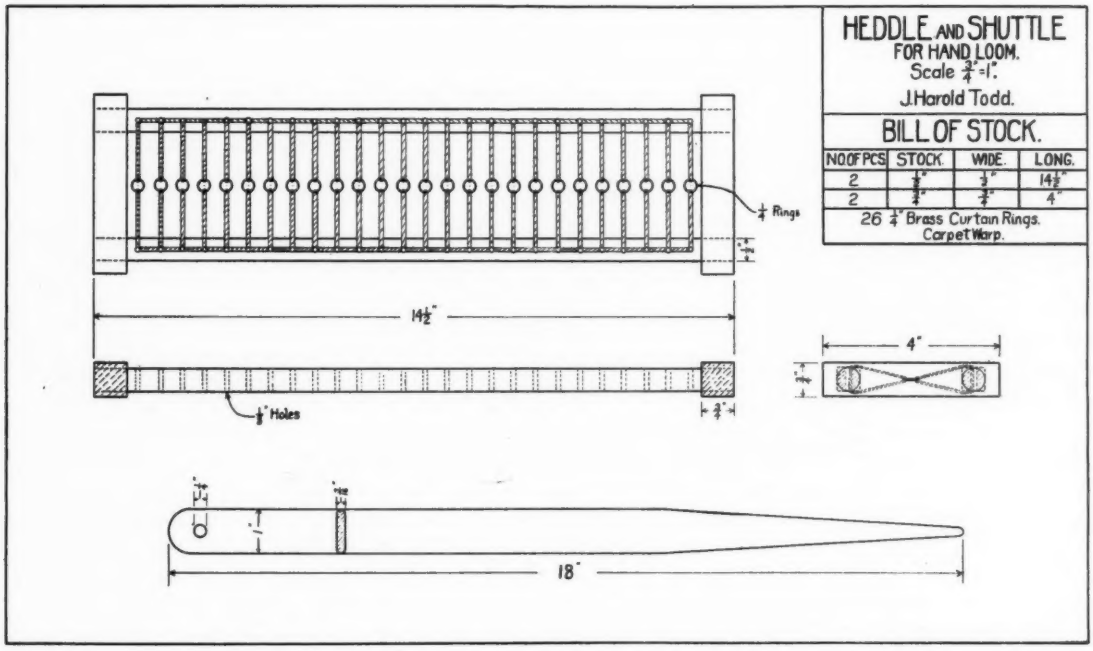


FIG. 2.

she wished fine, hard-twisted yarn she turned the wheel faster and drew harder on the fibers. Sometimes the yarn was not spun firm enough at the first operation, and so it was respun as many times as was necessary to give the quality desired.

For many years people continued using the same primitive methods of producing yarn. About the middle of the eighteenth century, however, reforms of various kinds in the manufacturing world began to be introduced. These completely revolutionized carding and spinning. We recall that at first, carding was accomplished by the hand process of brushing with wire

brushes. This method was gradually improved by Paul, Hargreaves, Arkwright and Lees, until by 1774, carding had become strictly a modern process accomplished entirely by machines.

Before carding, the fibers must be prepared, as for instance, cotton must be ginned and cleaned, and wool must be scoured and oiled. Then, if necessary, materials from various bales and bundles are thoroly mixed or blended by being fed at the same time to a rapidly revolving spiked cylinder. The fibers are carded or straightened out by a process somewhat similar to that of combing one's hair. It is sometimes accomplished by means of a slowly moving belt and a swiftly revolving cylinder, each covered with a large number of fine, wire spikes, between which the fibers are passed.

Because of the invention of automatic carding machines, which greatly lessened the work of preparing fibers, and on account of numerous inventions in the weaving industry, there came to be a great demand for spun yarn to keep the new weaving machines in operation and to take care of the carded fibers being turned out by the automatic carders. It would be necessary for some one to invent a mechanical device for automatically spinning several strands at one time.

In 1738, two partners, John Wyatt and Lewis Paul, invented a spinning device which used drawing rollers to pull out the yarn. About 1765, John Hargreaves, of Lancashire, England, took out a patent for the *spinning jenny,* a machine run by hand and worked intermittently, like the great wheel. Altho it could spin about a dozen threads at a time, they were of a quality which could only be used for the woof or filling threads in weaving.

About three years after this invention, however, Richard Arkwright, of Preston, England, got out a patent for his *water frame.* It had a continuous motion and caused the fibers to be drawn out by two sets of rollers, running at different speeds. The twisting was done by the *saxony flyer* on an upright spindle frame. The good parts of these two machines were united in 1779 by Samuel Crompton, of Bolton, England, in the *mule spinning frame.* It used the drawing roller, the upright spindle and the movable carriage. This machine proved very capable of making good yarn, which could be used for warp and woof alike.

Finally the triumph of skill in spinning was realized in the invention of the modern self-acting mule, by Roberts, in 1830. When this invention was finally perfected, spinning had again caught up with the production of the carding and weaving branches of the industry and the output of the three inter-related processes was again balanced.

Weaving.

Weaving may be defined as the art of interlacing threads of any material into a web. Those threads which extend lengthwise of the woven fabric are called *warp,* while those that fill the fabric, by crossing the warp threads, are called the *woof* or filling threads.

The *loom* is a machine provided for the weaving of various fabrics. In order to accomplish this it must be capable of making three different movements. (1) It must so separate the warp threads that a *shed* is formed, some of the threads being raised while others are being depressed. (2) The woof thread must be passed thru the shed formed in the warp. (3) The woof thread must be pushed tightly against the woven fabric. The process of weaving consists merely in carrying on these three operations in the order named.

Formerly looms were operated by hand, but on account of the rapid advance in the cost of labor, power-looms have displaced them.

Weaving was one of the first industrial arts to be taken up by primitive people. The Chinese, Hindus, and especially the Egyptians, became very proficient in the art and it was from these that it was introduced into England shortly after the Roman Conquest. The people of the United States learned to weave from the mother country.

When America was discovered the natives were found using a crude sort of loom. The warp threads were wrapped on a stick which served as a roller, while the finished cloth was rolled upon another stick. The operator either fastened the work vertically in the branches of a tree, or allowed it to lie horizontally on the ground. A long stick was used as a shuttle for the passing of the woof threads. On some of the government reservations our American Indians may still be seen weaving on looms differing but little from the crude ones of ancient times. These operators make up in skill what they lack by having such poor tools, and they often produce very beautiful fabrics.

All of the arrangements of warp and woof threads are based upon three primary weaves: the *plain,* the *twill,* and the *satin.* The plain weave makes the finest and strongest of fabrics. In this weave the woof thread passes over one warp thread, under the next and so on across; when it starts back, it alternates, passing under those threads that it passed over before and over the ones that it passed under before. Only one heddle is needed to form the shed in this simple weave. By using this form of weaving, we get the greatest possible number of thread crossings per square inch, thus insuring a very strong and durable fabric. When the twill weave is used, the woof thread passes over two warp threads, under two warp threads and so on across the fabric; on its return, it goes over two threads, one that it passed over and one that it passed under, on the previous trip; then it passes under two threads, one that it passed under and one that it passed over, on the previous trip, etc. This sort of fabric, woven with three *heddles,* has a stripe in the weave, which runs diagonally to the right or left. In the satin weave, the woof thread passes under one warp thread, then over four warp threads and so on across the fabric. Upon returning, it passes under one warp thread, then over four warp threads and continues just as in the previous trip across, excepting that

the warp threads passed under are shifted each time two spaces, either to the left or right. Five heddles are required for the simplest satin weave.

Projects.

Along with the study of textiles there should, of course, be carried on a series of projects based upon the industry being investigated. The projects should serve to make the manipulative processes clearer to the children. Projects should be provided to illustrate in a simple way the processes of carding, and spinning, weaving, dyeing, the testing of fabrics to determine their composition, etc. In this paper we shall discuss, as an example, the treatment given to the processes connected with weaving. From the discussion given earlier in the paper, it will be seen that weaving, as carried on today, is in no sense a darning process. The child, therefore, who uses a needle to sew over and under the warp threads, tho he may eventually produce a creditable rug, has learned practically nothing which would aid him in understanding or appreciating the weaving process. In fact, he has probably formed in his mind a concept which is entirely wrong. If we would put more educational value into rug weaving, we should make it more productive of thought, else it becomes a form of *busy work*, a mere waste of time. In the looms used in industry, we find that certain warp threads are raised automatically in order that the shuttle may pass thru the shed. The same warp threads are then depressed and the shuttle returns thru the newly formed shed. Our looms made in school should involve in their use these same principles if they are to clarify in the child-mind the idea of weaving. Figures 1 and 2 illustrate suitable looms for school use. The child will then not only learn to conceive of weaving as an actual industrial process, but he will be given an opportunity himself to experience many of the difficulties involved in building a loom for the purpose. The directions given below can be effectively carried out in any of the three upper grades. In most school systems, however, we are of the opinion that the work will be found especially adapted to Grade IV.

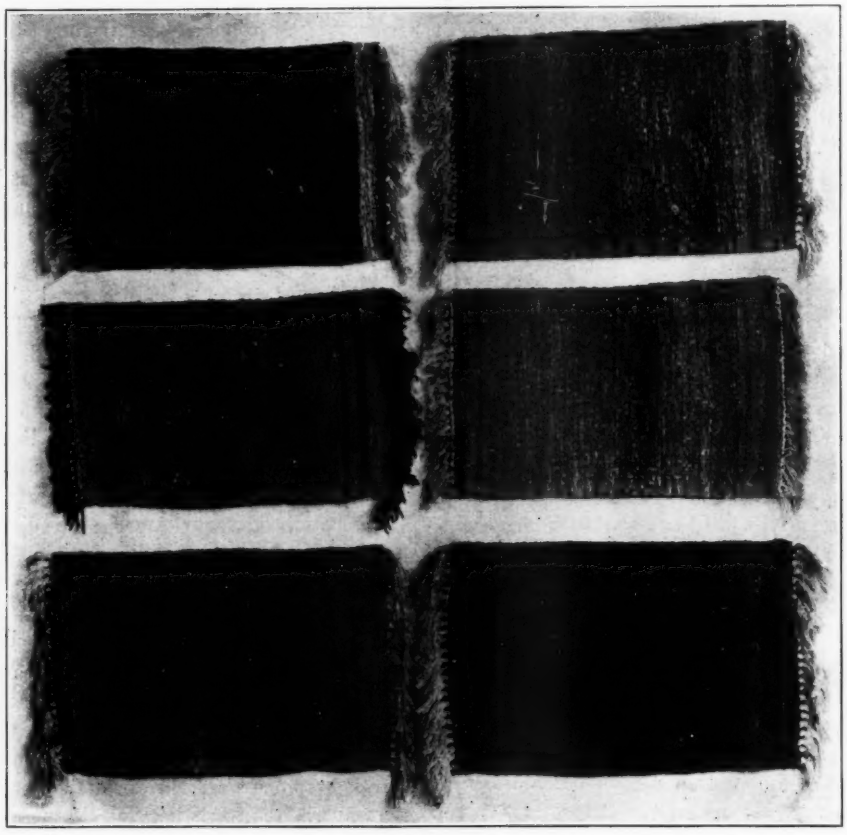


FIG. 3.

Directions for Making a Simple Loom.

In making the loom, shown in Figures 1 and 2, three parts must be constructed, i. e., the *loom frame*, the *heddle*, and the *shuttle*. It is advisable to use a soft wood with a fine grain such as white pine. Screws will be needed to fasten the frame together, brads to key the joints of the heddle, and small brass rings to be used in making the stringing of the heddle permanent.

The Loom Frame.

We shall consider first the making of the loom frame. The wood needed may be ordered cut to exact size if no wood working tools are at hand with which

to work. Two pieces ¾″ by 2″ by 19″ will be needed for the loom frame ends, and two pieces ¾″ by 2″ by 24″ for the sides. These parts will be fastened together at right angles at their ends. The steps in the construction of the loom frame are as follows:

(1) On the loom end parts locate and place points for two screw holes at each end, ⅜″ from the edges and ⅜″ and 15⅝″ from the ends, (2) Drill holes entirely thru the stock at these points using a ⅛″ drill in a hand drill or brace. (3) Place the loom frame ends on top of the loom frame sides their ends being even and the two parts forming a right angle. (4) Drive the screws thru the holes in the loom end parts with a hammer and then fasten the parts together securely using a screw driver. (5) Smooth the frame with No. 0 sandpaper. (6) On each loom frame end part drive two rows of 26 each ¾″ No. 16 brads, driving each to within ¼″ of the head. (This may be done accurately by placing a strip of stock ¼″ thick close up to the brads being driven and driving until the hammer head comes down upon the ¼″ stock.) Place the brads ½″ apart and arrange the two rows so that the brads in the inside row are each time half way between two brads in the outside row. This is technically known as staggering the brads.

The Heddle.

The making and stringing of the heddle are accomplished as follows: (1) Two sizes of stock will be needed; two pieces ¾″ by ¾″ by 4″ for heddle uprights, and two pieces ½″ by ½″ by 14½″ for heddle horizontal parts. (2) Measure from each end of the upright parts on the same side ⅝″ and draw a line across the stock. (3) Measure on these lines ⅜″ from one edge and place a point. Repeat on each end of both the upright parts. These points are in this way located in the center of the stock laterally and ⅝″ from the ends. (4) Bore ½″ holes entirely thru the stock at the points thus located, using a No. 8 spur bit, and being careful not to split the wood. The holes will serve as mortises for the *mortise* and *tenon* joint used in fastening the uprights and horizontals together. (5) Mark off on the horizontal parts from each end, the width of one of the upright parts. (6) Using a No. 8 Forstner bit, mark a ½″ circle on each end of each horizontal part centering the bit on the end of the stock and revolving it backwards. In this way a ½″ circle is marked accurately. (7) Cut down the ends of the horizontal parts, thus forming cylindrical tenons to fit the round mortises in the uprights. This cutting is done with a sharp knife, working to the lines drawn with the pencil and with the Forstner bit. (8) Mark a line lengthwise on one side of each horizontal part, in the center laterally, and mark off on this line 26 points ½″ apart. (9) At these points drill ⅛″ holes entirely thru the stock. (10) *Assemble* the heddle by fitting the mortises in the tenons. (The joint may be glued if desired.) The direction of the holes drilled in the horizontals should be at right angles to the uprights. The tenons

Fig. 4.

are prevented from turning in their mortises by *keying* with a ¾″ No. 16 brad driven in from one side of the uprights thru the tenon. If cabinet makers' clamps are at hand the heddle may be clamped for keying. (11) *Sand* heddle frame with No. 0 sandpaper.

Stringing the Heddle.

String the heddle now in such a way as to place the ¼″ brass rings[1] in a straight line just half way between the heddle horizontals. Each person may work out his own system, but he must be sure that he is systematic. The rings are held in place by an auxiliary string stretched half way between the horizontals.

Stringing the Loom.

In stringing the loom the heddle is held in place by an auxiliary string stretched across the loom frame. The warp string is now tied to the outside brad at one end of the loom frame; then it proceeds on thru the heddle frame passing between the heddle upright and the first brass ring the first trip across; then on, to the outside brad at the farther end of the loom; back thru the first brass ring, to the brad, and so on. When the last brad is reached the string is tied securely.

The Shuttle.

A shuttle may be made from an old wooden yardstick, or from strips of softwood 3/16″ by 1″ by 18″. An eye to receive the woof string is bored with a ¼″ forstner bit and the shuttle is whittled to a point. It is then sanded.

Directions for Weaving.

(Rug woven on the looms discussed above are illustrated in Figure 3.)

The weaving is accomplished by the following method: (1) Unwind about five yards of the material (chenille is perhaps the best material for this purpose

[1]The brass rings may be obtained from any department store. They are sold as *curtain rings*.

altho rug yarn, cotton roving, and even old rags torn into ½" strips will make good rugs.) (2) The shuttle is threaded and the woof is passed thru, as one set of warp strings is raised by the operator as he lifts the heddle frame. (Figure 4.) (3) When the heddle is lowered the shuttle makes its return trip across the loom. (4) After each trip of the shuttle across, the woof string is beaten back tight against the growing rug. In order to keep the rug from pulling in at the sides it is advisable to bring each woof thread around in the form of an arc before *beating* it back. This will provide for more slack in the center of the rug. In case the rug pulls in, this slack can be stretched and the sides of the rug thus made parallel to one another. If this method does not produce the desired results the woof string can be pulled back about an inch after each trip across, this inch of slack woof being distributed in the center of the rug. When the rug has been entirely woven it is removed from the loom and the warp threads at either end are tied.

Tassels.

A fringe of tassels makes the rug more attractive. The tassels are easily made by winding warp string several (perhaps six) times around a small book. The cord should be wound loosely and tied. It may be well to wind around one finger or the entire hand, as well as the book. When the hand is withdrawn the string will slip from the book more readily. The loop of six strands is now folded over on itself and a smaller loop of twelve strands is formed. This loop is interlocked where two of the first two warp threads have been tied. After the interlocking is accomplished each loop is cut and a tassel formed. The tassels are placed entirely across both ends of the rug.

TRADE ANALYSIS IN THE PATTERN SHOP

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THE following trade and pedagogical analysis of a parallels pattern—the first job in an elementary course in pattern-making—is offered as suggestive of the demands made upon instructors by the modern school for more vital and thoro methods in shop instruction.

It illustrates the nature of methods as applied in shop practice at Oswego State Normal and Training School, in the Industrial Teacher-Training Department, whose function it is to prepare teachers for general industrial schools.

The course as organized and conducted covers in its scope commercial shop practice and is planned, in part, to contribute to the general scheme of the department's aims— that of supplying future teachers, with a generous background of varied trade experiences in order that they may be richly provided with a practical and working knowledge of examples of modern industrial subjects.

Altho the analysis submitted was prepared for a class composed, in the main, of high school graduates, it has been developed so as to apply, with perhaps slight pedagogical modifications, to students of any age in a like situation.

The actual construction of the job covers a connected series of lessons and will consume as many periods as the time allotted or the ability of the class requires.

The related trade and technical information runs parallel with the construction and is treated as the situations for its application arise.

As each new operation develops it is explained in the analysis in more or less detail. However, as it becomes recurrent in successive jobs, it need be only briefly noted. The fullness of an analysis depends, of course, upon the purpose for which it is to be used; i. e., in the hands of the teacher alone or in the hands of the student as well. In the case of the latter it assumes the double role of trade analysis and instruction sheet.

In imparting his instruction the instructor follows the analysis closely. In view of the fact that he is training future teachers each student is supplied with a mimeographed copy which he inserts in his note book to be used for immediate or future reference. Furthermore, each student should have a copy in order that he may be led to see the true worth of an analysis, and be taught how to make one.

The responsibility of training teachers is an important one and must be kept ever in mind. It is realized that to know how to do a given piece of work is one thing, and to impart this information is another. In view of this fact it is aimed to have the students make their own analysis of a single job. The following order of procedure as outlined by David James MacDonald in the Indiana University Bulletin, "Training Trade and Industrial Teachers Under the Smith-Hughes Law," has been adopted:

"1. Observation of teaching where it is evident that such analysis has been made by the teacher.

"2. Call attention of students by means of questions to phases of the teaching where trade analysis is most evident.

"3. Assign task of analyzing a simple piece of work, after being assured that the students understand what they are to do.

"4. Show them illustrations of acceptable trade analyses if necessary.

"5. Examine with them the prepared analysis in order to find out if the major operations have been included in correct sequence, etc."

A study of the needs of recent graduates has pointed out that apart from the theory and technical

skill they attained as students, they are dependent upon subject matter that they can refer to when in a "pinch." They require life belts, as it were, of concrete problems and suggestions—a stack of helpful information that can be used on the job. At least this is so, until they have passed thru the transitional period, existing from the time of graduation until they reach the confidence stage, of experience. For this reason the parallels analysis represents a combination of trade operations and instruction sheet. It has been so planned that should reference be made to it a year or more after graduation the information given therein would enable the student to recall readily the work he had covered months before.

PARALLELS PATTERN.

I. Trade Analysis—Statement of Principles and Processes.

A. *CONSTRUCTIVE PRINCIPLES.* The parallels pattern represent a simple, one-piece, solid pattern requiring no core, and illustrates the application of the allowance principles—shrinkage, draft, and finish —three basic principles, essential to pattern construction, made necessary, partly, by the nature of the metal to be used in the casting, the mold to be used, and the work to be done on the casting after it leaves the foundry. The construction of this pattern involves the following considerations:

1. *Interpretation and Reproduction.*

a. Preparation of layout board.

b. Careful study of blueprint or sketch in order to thoroly understand the job in hand.

c. Making of layout—a pattern makers' drawing or sized reproduction of the working drawing, that dimensions and shape of pattern will include allowances made for shrinkage of metal, for easy withdrawal from sand by molder, and for machining by machinist.

2. *Planning.*

a. Determination of most efficient way of molding from molder's, machinist's, and pattern-maker's standpoint.

b. Method of construction and determination of proper sequence of operations.

3. *Execution.*

a. Accurate laying out and actual construction of job.

b. Choice and use of finishing materials.

c. Use of pattern letters or figures or stenciling machine in marking patterns for purposes of recording them.

B. *TRADE OPERATIONS AND TOOLS INSTRUCTION.*

1. *For layout board including reproduction of working drawing.*

a. Determine kind and size of stock.

b. Cut out rough stock, using standard rule, steel square, and cross cut saw.

c. True and smooth one of broad surfaces for face side, using jack-plane and applying straight edge test with the use of framing square.

d. Select and plane face edge, squaring it first to face side and then straight as to length, using jack-plane, try-square, and framing square.

e. Square one end, first from face side and then straight as to length from face edge, using jack-plane, try and framing square.

f. Lay out drawing, adding finish and indicating draft, using the marking gage, shrinkage rule, try square, knife, and pencil.

g. Apply coat of orange shellac to surface of drawing.

2. *For Pattern Construction.*

a. Determine kind and size of stock.

b. Cut out rough stock allowing for planing and allowances. Use rip and cross cut saws.

c. True and smooth one of broad surfaces for face side. Use jack plane and apply straight edge test with try square.

d. Set marking gage by shrinkage rule to required thickness of pattern, including finish. Gage to thickness on both edges of stock from face side. Plane bottom side to gage lines. Use jack plane and apply straight edge test.

e. Set bevel to allow for draft and plane face edge squaring from face side. Use bevel and jack plane.

f. Set gage by shrinkage rule to required width of pattern including finish. Gage to width from face edge and plane with jack plane to gage line, squaring with set bevel to face side.

g. Square line with knife across one end of stock on face side. Take bevel already set and square lines with knife from line on face side on both edges of stock. Turn stock over and on bottom side, with try square and knife, square line connecting lines on both edges. With block plane, plane this end, to knife, lines, squaring from face side with bevel.

h. Lay off required length of pattern on face side including finish, and repeat operations, given under "g", on this end.

i. Sand paper pattern all over using block covered with sand paper.

j. Shellac pattern required number of coats, using fine sand paper after each coat until last coat is applied.

k. Fasten on pattern letters and figures.

II. Pedagogical Analysis.

A. *The Teacher's Aim.*

1. To have students construct the first pattern in an elementary course in patternmaking, a parallels pattern from which castings are to be obtained for use in the machine shop.

2. To illustrate fact that foundry and machine shop practice determines construction of pattern, thru application in simplest forms of allowances to be made, viz: shrinkage, draft, and finish.

3. To review elementary tool processes, care and use of familiar tools, fundamental operations, and shop terms for purpose of determining knowledge and ability or technical skill of student.

4. To supplement and add to student's stock of knowledge, related trade and technical information such as general principles of pattern-making, use and care of new bench and machine tools, new materials of construction, new operations, processes, etc., incident thereto, by means of shop talks, reading, demonstrations, and shop visits.

5. To emphasize safety first and accident prevention.

6. Keeping in mind that students are teachers in training, to impart instruction in terms of grammar or junior high school pupils, in order that students may not only attain to skill and intelligence as mechanics but that they may be shown examples of the shop-teaching process, class course, shop and tool room organization, trade analysis and shop ethics.

7. To consider trade economics.

Note—Many of the aims noted will carry thru the entire course. That is, they are applicable not only to the first job but to each succeeding one and would not necessarily be repeated in each successive analysis.

B. *General Statement.*

Students undertaking this course may or may not have had prerequisite courses in wood working and mechanical drawing. In a course in pattern making, for obvious reasons, it is strongly advised that they possess a thoro grounding in the use of common, hand, wood working tools. If such is the case then apart from the subject matter that is strictly new and applicable. The rest of the work is merely review matter such as any instructor desires to cover at the beginning of a course that he may satisfy himself as to the ability of his class.

C. *Methods of Approach.*

Assuming that the students have had previous experience in woodworking and mechanical drawing, the first period of the course covers lectures and discussions concerning pattern making, the significance of the trade and its relation to other woodworking trades, as well as its close affiliation with the foundry and machine shop. The certain general and more specific information peculiar to pattern making must be treated before the students can attempt to approach their work intelligently. With this introductory subject matter covered he has gained a perspective that is extremely essential. He is now prepared to begin his shop work in earnest for he has a why and a how foundation upon which to launch forth. To supplement the lectures, discussions, and demonstrations he has been furnished with a text from which is assigned outside readings from time to time as the need arises. The use of magazines, shop visits, is also introduced in this connection.

A detailed blue print is given each member of the class, after which follows discussions, on interpretation and reproduction. The necessity for the use of a layout in pattern making due to allowances that affect the shape and size of the pattern and the tools used. The preparation of the layout board follows this and precedes the construction of the pattern. Altho for simple patterns ordinarily a layout is unnecessary it does serve at the very beginning of the course a two-fold purpose. (1) It illustrates the use of the layout and emphasizes the allowance principles. (2) It furnishes a problem in fundamental, elementary tool processes and operations, thereby allowing the instructor to gage the knowledge and skill of his class. In a trade where the skillful use of tools is so essential, it is quite necessary that the students be impressed with this fact. Consequently the time to start this is at the very beginning, with continual reference thruout the course. As teachers they must attain sufficient skill in the use of tools, else their instruction will be slipshod and generally inefficient. Details must be constantly emphasized, and not merely considered incidentally.

The layout embodies the selection and care of proper tools, choice of wood and the calculation of the size of rough stock, the importance of the accuracy of dimension and the knife line, all of which make up the fundamentals that carry over directly into their first job. Furthermore, it is an example of trade practice and altho it may be dispensed with later, until, the more difficult jobs are reached, it has been found particularly valuable in introducing the course.

After the layout board has been prepared and the layout made, attention is directed to planning for the job. Thru discussions the methods of molding and construction are decided, with special stress placed on sequence of operation. The students by this time are in a proper state of mind to enter the executive stage of the work. They are conscious of methods of molding, allowances to be made, and construction, so after a determination of the kind and size of stock they want to use they go to the lumber pile and get out the rough stock for their pattern. Where students have attempted to start a job after just consulting their drawing they invariably cut stock under size. They are accustomed to work from blue prints about which no thoughts need be entertained for finish or draft, and as a consequence even tho these principles have been explained, they fail to apply them.

It is implied, of course, as the analysis reveals, that as the various operations progress, discussions are held as to methods best applicable. The question for instance of the amount of draft, shrinkage, material, finish, etc., are all determined thru a process of elimination of the various considerations necessary.

Each new step is treated as a separate problem, which is threshed out until a clear understanding of the purpose and reason, is arrived at.

Examples of this, taken from steps in the analysis, will serve as concrete illustrations of the point in mind.

It will be noticed that following step (c) in the pattern analysis, instead of securing a face edge as is ordinarily the procedure, after a face side is established, the pattern is planed to thickness. This is done, because with draft first allowed for, on the sides, the pattern

would be injured when placing it in the vise. The stock is rather short, making it difficult (in the case of beginners) to plane, butting it up against the bench stop.

After all, the construction of the pattern may be accomplished in a number of ways, according to the ability and whims of the pattern maker. What might be awkard for one would be easy for another. There are right ways and wrong ways. So, often, a trade analysis will resolve itself into one, of several ways, depending somewhat on the viewpoint and equipment. It is important, however, that up-to-date commercial methods be chosen.

The bevel is used at first in determining draft. Later on its use may become superfluous, as with the journeyman, who in planing, unconsciously allows for it.

It will be noticed that the author has not considered the use of machinery in the construction of the pattern. Here again the fact, that the students are teachers in training, is the determining factor. Teachers of trade or industrial subjects must become proficient in the use of hand tools, if they are to teach efficiently. Furthermore, many of the school shops in which they will find themselves after graduation, will not be equipped with all the machines found in the modern shops. They must be prepared to meet situations as they are and not necessarily as they should be. After the students have acquired satisfactory skill and technique, they are of course taught and allowed to use the machines. However, let it be understood that this applies particularly to beginners. Students that have had a thoro grounding in the use and care of hand tools, before they reach the pattern shop, are certainly allowed and encouraged to use all the machinery to its best advantage.

Here again let it be said that it is the details that must be emphasized. Teachers often can be measured in terms of the sins of omission as well as commission.

The author has attempted to analyze the job and has selected methods that to him appear best in its achievement. With certain definite aims and ends in view, the matter might be said to resolve itself into a decision of the wise selection of the means, compatible with practical common sense.

And so the pedagogical analysis might be continued, but enough has been written to illustrate at least one satisfactory method of approach.

What the profession needs and particularly at this time is a liberal exchange of views, suggestions as to methods, real examples of the problems that are so vital, and a generous and friendly amount of constructive criticism that will help clear up the weak spots and make for everlasting strength, in a phase of our country's interest that means much for its future. With this hope in view the author makes this contribution.

Acknowledgment is here made, both to Prof. McDonald's contribution to the field of trade analysis, in the Indiana University Bulletin, and to Mr. R. H. Rodgers, of Stout Institute whose timely articles in the INDUSTRIAL-ARTS MAGAZINE, have been of so much practical inspiration.

A MOVABLE PLAYHOUSE

Rea McCain, State Normal College, Bowling Green, Ohio

The Puppet Theater Announces Its Opening Performance, Robin Hood, at 2 o'clock in Room 315.

IT is an easy way to give a good show. That is the reason we experimented with the puppet theater. We might go back to early Egypt to establish a long and honorable record for the dolls but the historical side is not what commended the venture.

Frankly we are always interested in what will raise a good laugh and furnish some wholesome fun. This we have found in our puppet theater.

The construction is very simple. The stage is formed of two skeleton boxes, one resting upon the other. The lower part is composed of four frames hooked together at the corners; the front and back sections are 72″ by 48″, the sides 36″ by 48″. Our carpenter suggested that the lower bars of this frame be raised slightly as the four legs thus formed would stand more evenly on a possibly irregular floor than a solid base.

The upper section, or stage proper, is hooked together in the same manner; the front and back are 48″ by 32″, the sides 24″ by 32″. The front section rests upon the upper bar of the under frame, the back upon a bar, which fits in grooves cut in the sides so that the bar will be parallel to the front. We have then a small box resting upon a larger one, flush with it in front and both in skeleton merely. The smaller is the stage, the larger is planned to conceal the operators.

Our curtains are made of rep. The lower portion, gathered in a band, is fastened on by means of brass rings slipped over headless nails, which have been bent almost flat. This is further covered by a closefitting strip of the rep edged with gimp. This has a top which covers the side portions of the box extending beyond the stage.

The side curtains of the upper part are hung exactly like the lower, the front is not gathered in but has sewed to it a number of small brass rings thru which is run a wire. At the middle and end this is attached to screw eyes securely fastened in the frame. On this wire the curtains may be drawn back and forth. A scalloped piece of rep edged with gimp completes the top.

The scenery is made of crepe paper fastened on a cheap muslin foundation. It is in poster fashion, each

section being outlined in black. An effort at more realistic scenery failed, the blocked-in background proving more effective. Crepe paper is preferable to card board for its rougher texture which makes a better play of light. The sky is very blue and the grass very green but the line of black between prevents harshness. In sewing the sections to the muslin it is well to take the stitches with the grain of the paper which should run up and down. The width of the paper is not enough for the sky. We did not want to make this smaller, preferring to keep the earth about one-third of the space. We pieced the sky paper at the top where the fly conceals it from the audience. This fly is formed in exactly the same manner as the background, the tree edges cut in the muslin and the blue sky line reaching to the opposite side of the frame. The scenery is tied in with tape. The entire apparatus can be taken apart and laid flat against the wall for convenience in storage and moving from one place to another.

We have planned the theater with the idea of using it a number of times. If you want to give only one performance it would be simpler to drape an old-fashioned clothes horse or form your stage in a doorway. In place of our rep curtains you could use portieres or couch covers.

The girls who manipulate the puppets are seated on a long bench of such height that their heads do not show when the curtains are open. The doll head is poised on the first and second fingers, preferably of the right hand altho it is possible to manage one on each hand. The body, fashioned out of muslin and resembling a night shirt, is slipped over the head and fastened around the neck of the doll. The lower end is tied down to the arm by tapes. The arms of the puppet must be curved downward more than in the ordinary rag doll and are easier to manipulate when stuffed firmly. The little finger reaches into one, the thumb into the other, the third finger is curved around just below the neck. The body is not stuffed but is left free to be bent by the motion of the wrist.

Any desired type of costume can be made. It is better to fasten down the lower edge, as the jackets tend to poke up and give a hunched effect.

We wanted to give Robin Hood, and character dolls were too expensive for the purpose. We bought cheap doll heads and used a simple make-up. The ordinary doll's wig is formed of hair woven in long strips and sewed to a foundation. When ripped loose this can be cut in pieces which make very satisfactory beards and mustaches. They can be attached with glue but this must be renewed before every performance as it dries and cracks off. The eyes should be darkened around heavily to give more expression to the face.

It is tiresome to hold the puppets up long at a time and difficult to make sure they are at exactly the right height so we suspended a bar from the stage. On this the girls rested their elbows to their greater comfort.

Exaggeration of action is to be sought. Much moving of head and body adds to the effectiveness. It is not necessary to learn the parts. Typewritten copies of the play can be fastened to the frame by thumbtacks. We put three copies on the front, using long strips of paper which hung far down. It is necessary to have copies in different positions as the girls' arms may obstruct the view at times.

The light comes from an electric bulb placed back of the scalloped upper curtain. It falls directly on the puppets and, as the employee who wired for us said, "It makes the little fellows show up."

Our expenses are as follows:

Frame (made by carpenter)	$10.00
18 yards rep at $1 a yard	18.00
6 doll heads at 50c each	3.00
1 wig	.75
10 yards sateen at 50c a yard	5.00
4 yards muslin at 15c a yard	.60
6 rolls crepe paper at 5c each	.30
6 dozen brass rings at 3c a dozen	.18
6 bolts of tape at 2 for 5c	.15
Total	$38.08

We were preparing this for permanent use; if a church or school entertainment were being given where it was to be used only once it would be unnecessary to make such elaborate preparations. Borrowed curtains

PUPPETS USED IN THE PLAY "ROBIN HOOD."

might drape an impromptu stage, and neighbors' scrap bags could dress the puppets.

Using this as a sideshow at a festival one would be assured of constantly filling the room and repeating the performance until the operators were tired. Our play has six characters, but only four operators were needed, Sir Richard and the Land lord being manipulated by one girl, the Sheriff and the Little Old Woman by another.

THE PLAY OF ROBIN HOOD.

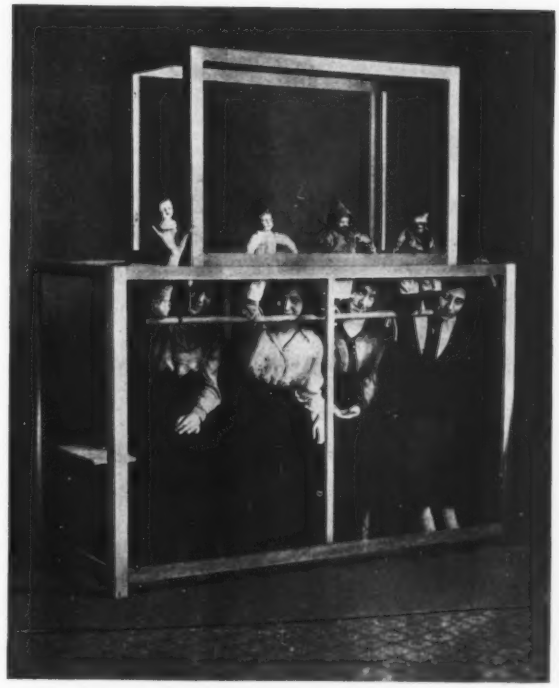
Characters.

Robin Hood, outlaw and friend of the poor.
Landlord of Ye Boar's Head Inn, a friend to Robin Hood.
Sheriff of Nottingham, Robin Hood's enemy.
Merry Old Woman, a peasant.
King Richard, truehearted King of England.
Sir Richard of the Lea, loyal subject but friend of Robin Hood.

Scene I.

Edge of Sherwood Forest, near Ye Boar's Head Inn, Merry Old Woman's cottage behind trees at right. Robin Hood and Landlord talking.

Landlord—The King has offered a good round sum for Robin Hood.
Robin Hood—Who is coming to take this same Robin Hood?
Landlord—The Sheriff of Nottingham swears he'll have the rogue before the week is out.
Robin Hood—He will? In that case I'll just stay by and see the fun. It will be a merry sight when the Sheriff takes Robin Hood to the King.
Landlord—There comes the Sheriff now.
Robin Hood—If that's the case I'll step behind a tree. I'd not like to be in the way when such grand folk as the Sheriff come but I'll stay where I can see the fun.
(*Robin Hood hides behind a tree as the Sheriff enters.*)
Sheriff—My good man, have you seen that knave Robin Hood today?
Landlord—No knave has gone by today, Your Worship. Do you think I'd have any such folk at my Inn?
Sheriff—Yet I was told a man came here just ahead of me.
Landlord—Does Your Worship mean the good man who talked with me not five minutes ago? He was no knave, but an honest good fellow who helps the poor and gives to widows.
Sheriff—The man I want is an arrant knave. He shoots the King's deer and His Majesty has commanded that he be taken and brought to court. Does he not live in this forest?
Landlord—O, Your Worship, a poor inn-keeper would not dare have anything to do with such bold, bad men as you say this Robin Hood is. It's not from me you'll be finding where he's hiding.
Sheriff—Look you, do not let the fellow pass you by. I'll give four score angels of bright gold to the man who captures Robin Hood.
Landlord—There will be many men looking to see who'll capture Robin Hood. 'Tis not the likes of me will be getting your four score angels of bright gold.
Sheriff—Maybe not, my man. 'Twill take a strong man and brave to capture the rascal. I'm even looking after him myself. But first I'll go back and send my men in different directions thru the forest. We'll get him before the day is done. (Goes back.)
Landlord—'Tis not the likes of me will be getting your four score angels of bright gold for giving up Robin Hood.
(*Robin Hood comes forth.*)
Robin Hood—And so I'm to be taken today. Perhaps the Sheriff will give himself his four score angels of bright gold. He's so sure he's going to take me.
Landlord—And has Your Worship seen the bold bad man?
Robin Hood—No later than you yourself I saw him.
(*Merry Old Woman appears from behind the trees.*)
Old Woman—O good sire, don't stop to joke about it. The Sheriff will be back in a few minutes. He is putting his men all around so that you may not escape.
Landlord—Where are all your followers?
Robin Hood—I sent them today to help a poor man whose house burned down. They are building him another and I came here to find Little John who has gone to look for a cow and a pig to give the poor man.
Old Woman—Then they can't come to help you when the Sheriff brings his men.
Landlord—I'll warrant Robin Hood will be a match for the Sheriff of Nottingham.
Robin Hood—Since there's no place to go I'll stay here and see the fun.
Old Woman—O Master Robin, I've a plan. You saved my son when the cruel Sheriff wanted to punish him for what he hadn't done. You gave me wood and food last winter when I'd have gone hungry if it hadn't been for you. Now I'm going to save you from the Sheriff. Go in my cottage there. Take a skirt and a shawl and a cap of mine, then sit here by my wheel, leave me your cloak and your cap. I'll dress myself in them and hide nearby. The Sheriff will see the cloak of green.
Landlord—He'll be taking you to the King.
Old Woman—A fine long ride that will be. I've always wanted to see the world.
Robin Hood—What might the Sheriff do to you?
Old Woman—What can he do but bring me back? I'll keep my face covered so close he'll never know I'm not Robin Hood till he gets me to the King.
Landlord—Aren't you afraid of the King?
Old Woman—The King won't hurt an old woman like me. Maybe I'll get to tell him all about my son and what Robin Hood did for him. 'Twill be a fine thing for a poor old woman to see the King.
Robin Hood—Well, good woman, I'll try your plan. If harm comes to you when once you're away from this place, blow on the horn I'll give you and any of my men who chance to be near will come to your rescue.
Landlord—Make haste, good Robin Hood, and be ready. The Sheriff may soon return.
Robin Hood—And you'd not have such a rascal found at your place?
Landlord—Faith and I think it will take a better man than the Sheriff of Nottingham to find him any place.
(*Robin Hood goes to cottage to change apparel.*)
Landlord—It's a good joke you're playing on the proud Sheriff. You may wish you hadn't. He'll be good and angry when he finds how he's been fooled.
Old Woman—There are many around would do as much for Robin Hood. He takes from the rich what they've stolen from the poor and gives it back again. He's never harmed a poor man and those who have suffered from the faults of others find him their best friend.
Landlord—Mind you what he did for Sir Richard of the Lea?
Old Woman—I've never heard of that.
Landlord—Sir Richard had been fair in all he did. He'd never taken the last penny from the poor but he'd given to them instead. One day he found he owed a lot of money. He'd borrowed from the Sheriff of Nottingham. This same noble Sheriff planned to take all he had but Robin Hood knew who'd taken the money which belonged to good Sir Richard so he stopped the thief and gave the money back. The Sheriff was fine and angry and swore he'd get the land, anyway, but he couldn't. Robin Hood saw that the money was paid on time.
Old Woman—Does the Sheriff know who helped Sir Richard?
Landlord—That he does and he's sworn to capture Robin Hood.
(*Robin Hood returns.*)
Robin Hood—Do you think the Sheriff will know Robin Hood when he sees him?
Landlord—He'll have sharper eyes than he did before if he does.
Old Woman—Now get you over here, good Robin, by my wheel and don't you answer when he speaks to you.
Robin Hood—A fine thread I'll spin at the wheel.
Old Woman—Mayhap the Sheriff won't know how to spin, either. He'll not know the difference between a good thread and a bad one.
Landlord—Here he comes now.
Robin Hood—Then I'll begin to spin.
Old Woman—And I'll hide in my house.
(*She leaves as Sheriff enters.*)
Sheriff—Has the rogue come this way since I left?
Land lord—I've seen nothing of any rogue, Your Worship, unless one is coming now.
Sheriff (looking back)—No one will be coming now except my own men. Perhaps that old woman has seen Robin Hood. No doubt she sits there and spins all day. Old Woman, have you seen a rascally knave called Robin Hood go by here?
(*Robin Hood makes no answer.*)
Sheriff (To Landlord)—Is she daft that she does not answer me? What sort of woman is she?
Landlord—Indeed, Your Worship, the little old woman has lived there so long and kept so busy and so happy the whole country speaks of her as the Merry Old Woman.
Sheriff—Well, my Merry Old Woman, answer a plain question. Have you seen Robin Hood? (Robin Hood does not answer.)
Landlord—Your Worship, I'm sure Robin Hood could not have gone by without my seeing him. I've been at the door ever since Your Worship was here before and I dare swear I've seen all that have been here.



The Frame used for showing the Puppets.

Sheriff—Not much use trying to make a deaf old woman talk. Sometimes there's something hidden under their shawls and caps but this old woman is a silly old soul. I'll look thru her cottage and make sure he's not hiding behind the door.
Landlord—I'll warrant Your Worship will find him if he's around. You'd never let the rascal get away.
Sheriff—He'll not get away this time.
(He enters cottage, returns in a moment with Merry Old Woman who hides her face with the green cloak.)
Sheriff—Here's the knave now. Under your very noses he was hiding but he couldn't hide from me. I saw his cloak of green and had him in a minute. Not a word out of him.
Landlord—Not a word out of him, Your Worship?
Sheriff—He didn't dare speak. On ahead, you knave. We'll go to the King for that reward he's promised.
(*Goes out with Old Woman.*)
Landlord—Ay, the King will reward you for that catch.
Robin Hood—I'll go see the King reward him for catching Robin Hood.

Scene II.

Sherwood Forest. The King and Sir Richard of the Lea enter.
King—Is it not near here that bold fellow Robin Hood lives?
Sir Richard—It is, Your Majesty.
King—I'd give a round sum to see the fellow for I hear he's a merry knave.
Sir Richard—Much do I owe to Robin Hood, Your Majesty, and it were a shame for me to keep silence when he is mentioned. Outlaw tho he is, there is no man so good as he to the widowed and the poor.
King—I'd like to see him. The Sheriff of Nottingham asked permission to bring him and promises today to seize him.
Sir Richard—If he captures Robin Hood he'll change his tactics from those he's tried before.
King—How's that?
Sir Richard—He tried last month to get hold of Robin. He prepared a great shooting match and watched for the men in green. He knows the outlaws of Sherwood Forest are the truest with the bow of any men in the kingdom and he thought they'd come to the contest.
King—Did they come?
Sir Richard—No man in green was there. Many fine shots were made and the Sheriff gave the prize to a rough fellow in tattered scarlet.
King—Who was the fellow in tattered scarlet?
Sir Richard—No one knew and all wondered. The stranger disappeared and no one saw him again but that night an arrow came in the window of the Sheriff's home at Nottingham and to it was tied a scroll on which was written:

"Now Heaven bless thy grace this day,
Say all in sweet Sherwood,
For thou didst give the prize away
To merry Robin Hood."

King—He's a brave fellow after my own heart. Is there any way to meet him in the greenwood?
Sir Richard—If Your Majesty wishes, we might do as bold Robin Hood did, disguise ourselves and go forth. I know his haunts.
King—It is a good plan. How shall we set about it?
Sir Richard—In a pack behind these trees I have some dark clothes such as monks wear. Let's put them on and look for Robin Hood. He should be near here.
(*They retire behind the trees and Robin Hood enters.*)
Robin Hood—Now where is the King? Along this road I was told he went but no trace of him can I find. (Turns and looks around.) There is some one hiding behind those trees. Here in my forest of Sherwood I'm determined to know what's going on. Ho, there, who's hiding in Robin Hood's forest?
King (Coming forth in monk's attire)—One who fears not Robin Hood nor any of his band.
Robin Hood—You're a brave man to say that. One blast upon my horn and Robin Hood and a dozen men would come to overpower you.
King—Does he need a dozen men to fight one poor traveller? I did not know he was a cowardly knave.
Robin Hood—No one ever called Robin a coward.
King—I'll call him so if he comes with a dozen men.
Robin Hood—He does not come with a dozen me. He came alone and alone he'll stand your challenge.
King—Are you Robin Hood?
Robin Hood—Men do call me so.
King—Robin, shall we have a fight and see who's the better man?
Robin Hood—Who are you who ask to fight?
King—One who would prove he's a man and fights like one, tho he has no name like Robin Hood and no horn to call aid.
Robin Hood—Maybe you'll need aid when you strike Robin Hood.
(*King advances, both strike and Robin reels back against a tree.*)
King—Sir Richard, not yet attired? Who is that coming down the road thru the forest?
Sir Richard (*Coming in a dark cloak like the King's*)—It is the Sheriff of Nottingham and he's bringing with him some one in green like the outlaws of Sherwood Forest. Who is that back there?
King—A lusty rascal who disputed my right of way. He'll have enough to think of for a while. Let's see who this the Sheriff brings.
(*Sheriff and Old Woman in Robin Hood's cloak enter.*)
King—Who goes there?
Sheriff—The Sheriff of Nottingham goes with the rascally knave, Robin Hood, to seek the king. (Robin back in the trees draws nearer.)
King—The King, no doubt, will be greatly pleased.
Sheriff—He has offered two hundred crowns for the knave. It was a long hard search I had for him. He hid in woman's clothes and thought he'd get away. When he found I knew him he was so scared he could not speak and, tho I've brought him many a mile, he has not opened his lips.
King (Opening cloak)—Here is the King (*Robin Hood draws nearer*) and right glad is he to meet Robin Hood in Sherwood Forest. 'Tis a good man and true who overcomes the bold outlaw. You may leave him to us. Your reward shall be in due measure with what you've brought.
Sheriff—O, Your Majesty, who will guard the villan if I go? He might do harm to Your Majesty. He's given me a lot of trouble on the way. He's fought and tried to get away. I'll warrant you I've watched him closely. Now he hides his face before Your Majesty but many's the angry glance he's cast on me as we came thru. Had I not been a better man than he, you'd never have had the chance to see Robin Hood. I'd rather stay by and guard Your Majesty till he's safe in prison and the reward is paid.
King—Is Richard of the Lion-Heart so weak in arm he must have aid from others where one man is concerned? So be it. Stay and see the end of this adventure. (Turns to Old Woman.) Now, you whom the Sheriff brought, drop your cloak and let us see the eye whose angry glance the Sheriff has described. Drop your cloak. (Old Woman does so.) Ho! Sir Sheriff, whom have we here? Is this the bold outlaw of Sherwood Forest? What say you, Sir Richard? Is this the Robin Hood you know?
Sir Richard—I'm wondering whence came the angry glances which frightened the brave Sheriff of Nottingham.
Sheriff—The witches are in it. She's a witch who spirited away Robin Hood.
King (To Old Woman)—Who are you?
Old Woman (Curtseying)—I'm just a little old woman who knits and spins all the day.
King—How came you here?
Old Woman—The Sheriff of Nottingham came to my cottage and bade me go with him.
King—How now, Sir Sheriff, think you to palm off an old woman on me for bold Robin Hood?
Sheriff—It must be the witches have helped Robin Hood and changed him to this shape.
King (To Old Woman)—Do you know Robin Hood?
Old Woman—Please, Your Majesty, he's been very good to me. When nights are cold he brings me wood. I'd starve if he didn't bring me something to eat.
King (To Sir Richard)—What say you, Sir Richard?
Sir Richard—Your Majesty knows that I could see no harm come to Robin Hood because of all the good he's done to me.
King—Who's to have that reward you spoke of, Sir Sheriff? (Loudly toward Robin Hood.) Is there none here can tell me where Robin Hood is?
Robin Hood (Coming forward)—Your Majesty ——
King—Are you one who can yield that rebel outlaw to his sovereign King?
Robin Hood—Yes, Your Majesty, I come to yield up Robin Hood to his master, King Richard of England.
King—Then, bold Robin, Sir Sheriff, Sir Richard, and you who have been so true a friend to Robin Hood, let us go to London where waits the reward for him who surrendered Robin Hood the boldest heart in England and henceforth our favored subject.
(Curtain.)

PROJECTS OF FARM MECHANICS CLASS, BOX ELDER HIGH SCHOOL, BRIGHAM CITY, UTAH.

The trellis, pump house and garage shown in the above illustrations were made by students of the farm mechanics class of the Box Elder High School, under the direction of Mr. G. C. Laney. The Box Elder High School offers a complete course in agricultural shopwork under regulations laid down by the State Supervisor of Smith-Hughes Law Work.

A Seventh or Eighth Grade Problem in Sewing

Edna J. Benson, West Orange, N. J.

THIS problem was an outgrowth of some supplementary work given to girls, who had for some reason, neglected to bring their own.

We started with small, simple garments such as flannel skirts and underwaists. When several dozen such articles were completed, we were confronted with the problem of disposing of them. They could have been given to some institution, but it had been our policy to make the sewing department as nearly self supporting as was possible. Fortunately, the school nurse aided with their disposal and the demand far exceeded the supply. This occurred at the end of the year, so plans were carefully made to extend this phase of the work for another year.

Six weeks were set aside in which to accomplish this new task.

The girls had had sewing during the fifth, sixth and seventh grades, so they had acquired a sufficient amount of experience to speedily complete a large amount of work which found rapid sale among busy mothers. The sale of these garments was carried on by the school nurses. Complete outfits for children from six months to eight years, were made. Cut from carefully selected commercial patterns, the work was accomplished very quickly by working in teams. The class was divided into groups of four. One group cut, another sorted the different pieces, one basted, while another group stitched and a final group assembled and distributed partly completed garments to the girls to finish.

Every variety of underwear and night clothes was attempted. In addition to this, simple dresses, like the illustrations, were constructed. They were made up of attractive plaid gingham, chambray and prints.

Illustration I was a simple blouse with an apron effect overdress or slip. The applied trimming was bias bands of lawn, purchased by the piece and stitched close to the edges without basting. Some of these models were made with white blouses, the collars and cuffs being of the same material as the slip. This model was easily constructed, the blouse being of the one piece kimona type and the apron in two pieces with the ever needful pockets.

III II I

ROMPERS AND DRESSES MADE IN THE AUTHOR'S CLASSES.

No. II illustrates the one piece effect. Here the sleeves were set in, which proved a little more difficult than No. I.

The simple one piece kimona dress was another model. The bottom of the sleeve was turned up to form a cuff and finished with scalloped trimming. The neck was finished the same, as were also the pockets whose shapes varied. Belts were either all the way around or just at the back.

Boys' blouses were made by the dozens out of blue and white, red and white shirtings. All details were carefully planned so as to attain speed and efficiency.

Some of the flannel skirts, with feather stitched

hems, were attached to waists. Pink, blue and gray were the colors chosen.

Another article that found a ready sale was rompers made in sizes three and five. Pink and blue chambray was selected for these. This pattern was also of the kimona type, the sleeve being in one with the garment.

The dress illustrated as No. I sold for fifty cents, No. II for sixty, rompers for fifty, skirts without waists twenty-five cents, with waists thirty-five, night drawers fifty cents, and boys' blouses for thirty cents.

The prices quoted were just about the cost of materials used. It was no money making scheme, but it gave excellent practice to the girls at the same time making our department self-supporting.

The preceding article was written before our entrance into the War, and the training afforded by the problem proved of great value when we undertook the making of refugee garments for the Red Cross. About 2,000 of the latter were completed by three hundred girls and they knew how to attack the problem with ease and speed. Without this previous training not as much would have been accomplished.

The prices quoted were pre-war prices. During the war, our time was largely taken up with Red Cross work and the demand for garments from the community was so great, that we resumed some of that work and in spite of the high cost of materials, the clothes found a ready sale.

Skirts with waists attached sold this year for fifty instead of thirty-five cents, and dresses sold for seventy-five cents.

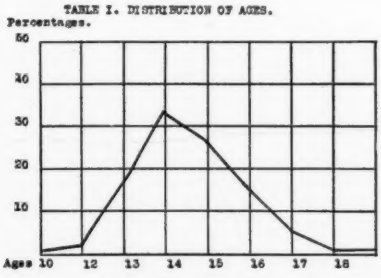
This project might fill up the gap left vacant by the Red Cross work. The girls enjoyed it and the value of making something other than for themselves was inestimable.

A Study of Data From a Vocational Questionnaire

Burl N. Osburn, East Junior High School, Sioux City, Ia.

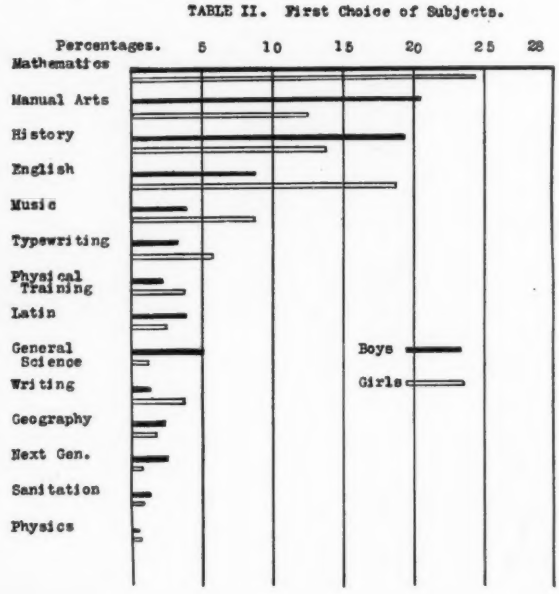
AN attempt is here made to summarize certain results of a vocational questionnaire given the students of East Junior High School of Sioux City during the school year 1918-1919. The questionnaire was given for the purpose of obtaining a more intelligent basis for vocational guidance. Not all the questions are discussed here, but only those which are capable of reduction to terms having a common basis. The other questions are of benefit only in individual cases. An example of such a question is the one asking for the name of three books read during the year. Answers to this question ranged all the way from the most typical dime novel, thru the usual line of books written especially for boys and girls of these ages and up to a select few scientific works which are entirely beyond children.

(a) Table I shows the result of the question asked to bring out the distribution of ages.



The range of ages is from ten to eighteen, inclusive. The median is slightly above thirteen; and the average deviation therefrom is between eleven and twelve months.

One of the questions called for the three subjects liked best by the pupil, in the order of choice. Table

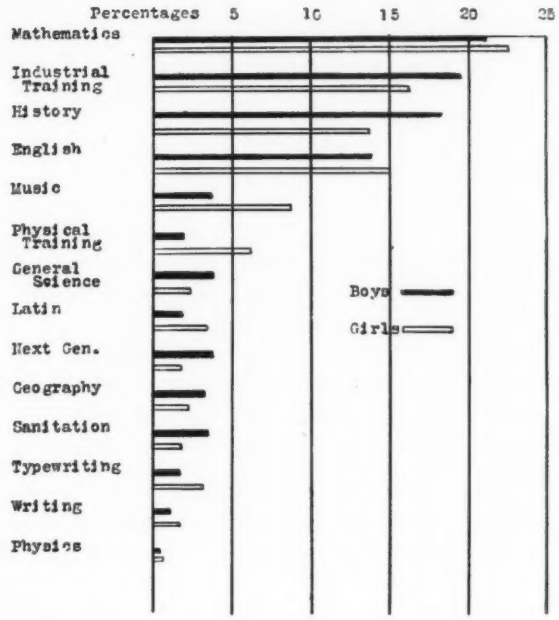


II deals with the first choices only. In the order of the sum of boys' and girls' choices, the subjects range as follows, in descending order: Mathematics, manual arts, history, English, music, typewriting, physical training, Latin, general science, penmanship, geography, next generation, sanitation and physiography. The boys lead in the following subjects: Mathematics, manual arts, history, Latin, general science, geography, next generation, and sanitation. The girls lead in English, music, physical training, penmanship and physiography.

The point of greatest divergence between boys and girls is in English.

In Table III the same question is discussed as in Table II. In this case, however, all three choices are

TABLE III. TOTAL CHOICE OF SUBJECTS.

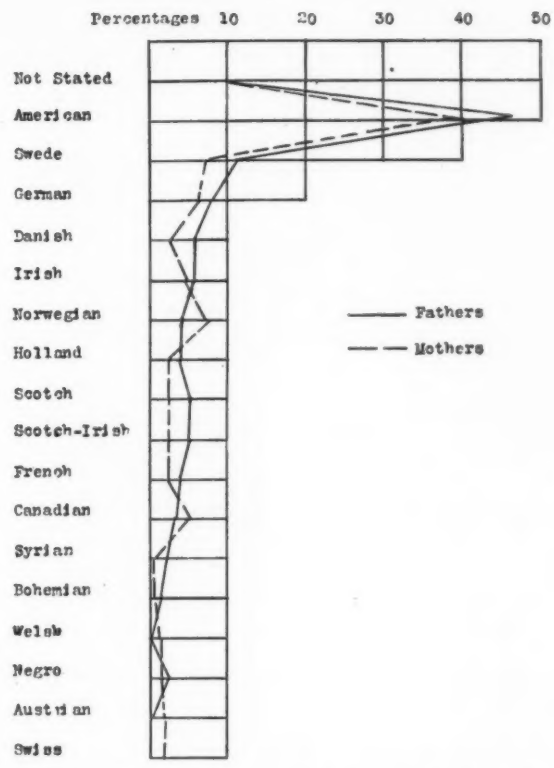


considered, whether first, second or third. The general arrangement of the sum of choices is practically the same as in the case of first choices, except that typewriting is relegated to a lower place and physical training is raised. On the whole, the curve representing the sum of first choices and that representing the sum of all three choices is so clearly correlated as to be practically identical. Probably in a larger number of cases it would tend more and more to become so. The boys maintain the lead in the preference of subjects in all cases mentioned before with the exception of mathematics and Latin, for which subjects the girls have greater preference, all choices considered.

A question was included asking for the nationality of father and mother. The question failed in that it did not call for discrimination between native and foreign born parentage. Had this been done, much more helpful and intelligent results would have been obtained. Forty-five per cent of the fathers and forty-one per cent of the mothers are Americans. The different nationalities represented number seventeen. In order of totals of both fathers and mothers, they are as follows: American, Swede, German, Danish, Irish, Norwegian, Holland, Scotch, Scotch-Irish, French, Canadian, Syrian, Bohemian, Welsh, Negro, Austrian, and Swiss. There is no great divergence in the number of fathers and mothers of any one nationality,—that is, there is about the same number of German fathers as German mothers, etc.

One question called for the occupation of father and mother. The case of the mothers may be disposed of quickly by saying that with very few exceptions, all were engaged in housekeeping. It was found that the fathers were engaged in 82 different occupations, covering all the main divisions of the census classification.

TABLE IV. NATIONALITY OF PARENTS.



In 28 cases the father was either dead, retired, or the occupation was not stated. Table V compares the occupational distribution of the fathers' occupations with that of the United States and Iowa. The occupations are classified in the eight groups as in the 1910 census, viz:

1. Agriculture, Forestry and Animal Husbandry.
2. Extraction of Minerals.
3. Manufacturing and Mechanical Industries.
4. Transportation.
5. Trade and Commerce.
6. Professional Service.
7. Domestic and Personal Service.
8. Clerical.

In agriculture, etc., the Morningside junior high school naturally falls below either Iowa or the United States.

There were no persons engaged in the extraction of minerals. In manufacturing and the mechanical industries, Morningside is much higher than Iowa or the United States.

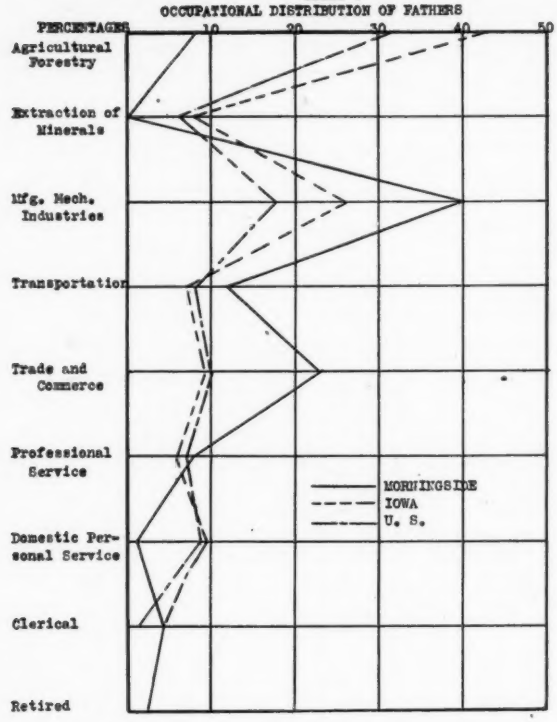
In transportation, it is higher but not as decidedly so as in manufacturing.

In trade and commerce, it is much higher. This was due to the large number of salesmen.

In professional service, Morningside also ranks higher.

In domestic and personal service it ranks very low. Hitherto, the occupational tendency has been the same as in the compared cases but in personal service, the

Table V
OCCUPATIONAL DISTRIBUTION OF FATHERS



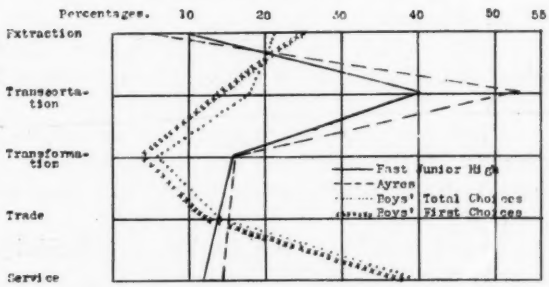
tendency is opposite. This may be something of an index to the character of the community.

In clerical work also, the tendency is opposite altho the percentage is about the same as in the other two examples.

Three choices of vocations in the order of preference were asked of the pupils. Table VI shows the distribution of the 69 different occupations chosen by the boys. First choice and total of all three choices are so nearly alike that they will here be considered as identical. Their widest variation being in the extractive occupations, in which a variation of about four per cent is noted.

The classification used here is as follows:

TABLE VI. COMPARISON WITH AYRES' 22,027 CASES.



1. Occupations of Extraction.
2. Occupations of Transformation.
3. Occupations of Transportation.
4. Occupations of Trade.
5. Occupations of Service.

By far the greater number of boys prefer the occupations of service, most of them being professional service.

In 1913, Dr. Leonard P. Ayres gathered data concerning the migration and occupation of the fathers of 13-year-old boys in 78 cities of the 25,000-200,000 class. The occupational distribution of these fathers is shown in Table VI by the dash line. The occupational distribution of the fathers of East Junior High pupils is shown in comparison by the solid line. The correlation is probably as close as almost any city would show. In transportation the percentage happens to be identical—13.1%.

A comparison of the choices of the boys with the occupations of the fathers shows a decided lack of correlation. In like manner, a comparison of their choices with the 22,027 fathers of Ayres' investigation shows as wide a difference. This seems to indicate that should the boys prepare to follow the pursuits which they have now chosen, economic conditions will compel them to change to occupations which are more in conformity with industrial conditions as indicated by the curves shown here.

This being true, one of two things must be faced. *Either we must in some way bring about a more normal selection by the group, or retain, later, those who are forced out by competition from the work they have chosen into some other occupation for which they were not prepared.* The first seems to promise a more possible solution. But how? In that question lies the whole problem of vocational guidance, and its solution is not yet in sight. We seem still to be training all too exclusively that group which expects to enter college and some lines of the professions. One thing that may be expected is that in the next few years many of these boys and girls will find other fields of effort that offer more promising outlooks than the ones they have chosen. Others, perhaps have changed by now. These and other factors modify the problem considerably, but on the whole it remains.

It is not a new problem, but rather a very old one that forces itself upon us more urgently day by day. It has certainly been greatly enlarged by the industrial revolution of over a century ago, and the industrial expansion of recent years. Perhaps too, we are beginning to take courage to meet it; whereas before, we accepted it as an inevitable evil, if indeed we saw it, or seeing it acknowledged its existence. The outlook is by no means dark but nevertheless calls for our greatest effort.

Professor King of Iowa State University has collected data regarding the vocational choices of 1,109 pupils of the Iowa City, Ottumwa and Dubuque High Schools. In compiling the results he has compared them with similar data obtained by Van Denberg for 1,000 pupils entering the New York High Schools. Both instances are compared here with the results of East Junior High.

TABLE VII.
COMPARISON OF OCCUPATIONAL CHOICES WITH THOSE OF PUPILS OF OTHER SCHOOLS.

	Iowa	New York	E. Jr. High
Different Occupations chosen by all	71	..	104
Different Occupations chosen by Boys	54	40	69
Different Occupations chosen by Girls	30	21	48
Percentage of Boys Undecided or blank	23%	41%	5%
Percentage of Girls Undecided or blank	23%	51%	3%

The wide range of choices of East Junior High School students is noteworthy; also the very small per cent of those who were undecided.

TABLE VIII.
INDIVIDUAL CORRELATION BETWEEN FATHERS' OCCUPATIONS AND BOYS' CHOICES.

A comparison of the number of cases in which the boy planned to follow the work in which his father was engaged shows that about 5% had so planned.

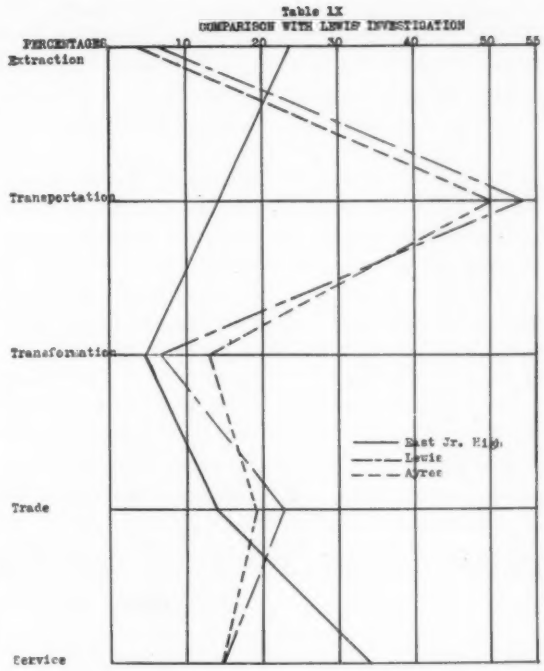
Occupations of Father	Number of Choices
Business	1
Cattle Buyer	2
Doctor	2
Farmer	2
Machinist	1
Railroad Work	1
Salesman	1
Veterinary Inspector	1
	11

No figures are available for comparison, but the situation seems fairly normal. Evidently Young America is not like Young China where the boy invariably follows the father's footsteps.

Professor Lewis of Iowa State University has carried on an investigation of boys between the ages of 16 and 20 who had dropped out of school before finishing high school. Among other things, the vocational ambitions of the boys was secured. In Table IX the summary of these ambitions is shown graphically in comparison with the ambitions of the East Junior High School boys. By comparing the Lewis boys with the occupational distribution of the 22,027 fathers of Ayres' investigation it will be noted that the correlation is high. This is to be expected since the boys are actually engaged in work, and many of them contented. By comparing the choices of these boys with those of the East Junior High School boys, it will be seen that the tendency is toward opposition rather than correlation. There are many reasons for this. Among them being the following:

1. The sheltered school life of East Junior High boys leaves them freer to aim at professional life.

2. The East Junior High boys are younger, which would account somewhat for their aims.



3. The "Lewis" boys were in a more industrial environment than the East Junior High boys, which would naturally bring them to see more possibilities in the occupations of that environment rather than in that of the professional life or farming, for instance, in which the East Junior High boys are largely interested.

4. The financial average of the East Junior High boys is probably higher, which would admit their looking toward the lives they do.

5. Many of the fathers of the East Junior High boys have made their way by very hard work, and refuse to allow their sons to follow the same hard path.

In all probability, many of the East Junior High boys will drop out of school before completing high school. The same forces which have brought to "Lewis" boys to aim at what they have will doubtless operate to change the aims of many of our boys here.

No attempt has here been made to discuss what can be done as a result of the study, or what should be done to solve some of our problems. All that will be mentioned here are the indirect results. Had the study been of no more benefit than to give us an idea of our situation and stimulate us to further effort, it would have been worth the time and effort expended.

Some of the indirect results are as follows:

Occupational help and record card. With the experience gained from the advantages and disadvantages of the questionnaire, a new card was devised that seems to cover the requirements of a card of this nature. These cards are put into the hands of the two Vocational Counselors, who personally interview the students and record the results on these cards.

Vocational guidance in all school work. We are planning a report which will summarize the Vocational

Guidance possibilities of East Junior High School. To this report, each department is making its own contribution, with its suggestions for better methods in making each course a Vocational possibility.

Occupational survey. An occupational survey of Sioux City is under way. Thru this, we hope to gain a fairly complete and comprehensive basis for future work, both in the nature of Vocational Guidance and the more technical training of the Senior High.

Summer work. It is hoped that the school will be able to serve as a placement agency for those pupils who want to work during summer vacation. Many who have not been accustomed to working would do so if some help were given them in the matter of finding a job.

Follow-up work. It is our aim to keep a record of all the students who have ever been enrolled in Junior High. This is not impossible, since the school is but two and a half semesters old. Accumulated data of this nature would be exceedingly valuable in a few years for a scientific study of the influence of various factors on "the expectation of school life" of Junior High School pupils.

Individual aid. From the nature of what has gone before, it might seem that all efforts are being made to study the individual only in his relation to the group, and not from the standpoint of his own personal problem. This is not the case. The group study can be of value only so far as it benefits the individual. One of the larger benefits to be gained by the individual is the stimulation it gives him to study and think thru his own problem. In this the Vocational Counselor should be the guide. Much of the knowledge of how to guide the individual comes from the knowledge of how the group has acted and what it thinks.

In all this work, we must begin and end with the individual.

Influence of Early Teachers Upon Modern Hand Work

Chas. A. King, State Normal School, Plymouth, N. H.

ONE of the greatest obstacles at the beginning and during the development of hand work in the elementary and secondary schools has been the difficulty in securing suitable teachers. Men possessing the required combination of technical skill and teaching ability were difficult to find, hence teachers of other subjects who had had tool experience or special manual aptitude were eagerly sought, but the demand far exceeded this source of supply, and because of urgent need selected individuals were drawn from the ranks of mechanical trades and assisted to a knowledge of the pedagogics of hand work.

The development of hand work as an educational factor has been largely due to the attempts of these early teachers as they acquired experience and vision, to adapt course content and method to their individual and often elusive ideals. This accounts for much of the diversity of courses and aims of hand work of the grade and secondary schools which has characterized this study.

The requirements of other studies are practically the same in every state, grade by grade, but the lack of uniformity in hand work is largely the result of the go as you please methods of these pioneers. However there has been a gradual harmonizing of requirements, as it appears that about every possible thought and ideal has been worked out, and the wheat separated from the chaff. New discoveries in the fields of psychology and pedagogy may inject new problems, but we are approaching that uniformity which will make possible the specific helps and sidelights upon hand work to which teachers of other and better organized subjects have access thru the educational journals. Tho a vast amount of excellent material has been published for the purpose of aiding the teacher of hand work, a great deal of it does not help the mass of teachers in the aspects of their work in which they need help the most, as so much of the material has been of the nature of directions for making articles of utility or pieces of furniture, valuable in themselves, but not touching the broad and vital problems of psychology and pedagogy to be applied dealing with individuals.

Perhaps the strongest influence against educational hand work has been the teachers who were taken from technical schools, for in most cases they have favored the technical rather than the educational or cultural side of the manual arts; this is the natural result of the shop work of the university which was entirely for its value in an engineering course. Naturally such teachers found it difficult to adapt themselves to work in carpentry or in furniture making which was the chief field of interest of boys of the grades and high school. The prevalence of abstract and semi-technical hand work, and the lack of appreciation of many teachers and laymen of the educational aspects of hand work, formed a wall of either indifference or of active opposition which the early leaders of manual education were compelled to surmount. Often this lack of appreciation was a counterbalance against the extreme ideas of some of the more enthusiastic devotees of manual education, and was, beyond doubt an important factor in the development of the present sane relation between the educational and vocational aspects of hand work.

To suggest reasons why the type of technique acquired by a teacher during his training influenced his viewpoints, and in the mass influenced by the development of types of hand work, we will consider the divisions of the woodworking trades, as usually woodworking is taught wherever instruction in the manual arts has been established.

While the workmen of all woodworking trades use the same fundamental bench tools and woodworking machinery, certain differences in the use of hand tools are based upon the kinds of woods commonly used by the different trades; for example, the patternmaker uses white pine almost entirely, which is one of the easiest of woods to work, while the joiner and the cabinetmaker must be able to work efficiently and economically upon all kinds of wood regardless of either grain or degree of hardness. The planes of the patternmaker do not require the fine adjustments to work upon pine which the cabinetmaker finds necessary in working such stubborn, cross grained woods as sycamore, white oak and maple, tho usually for the sake of economy the cabinetmakes uses a scraper in smoothing hard woods; this tool is difficult to sharpen and use efficiently and is rarely found in the possession of a patternmaker, who uses it only for the scraping of glue.

The block plane is not used by the carpenter and patternmaker so much as by the joiner and cabinetmaker in the making of fine hand made joints. The patternmaker seldom uses a wood file, the soft and straight grain of pine making it possible for him to use a chisel or gouge in places too small to be reached by a spokeshave, but the worker in hardwood finds no other tool will work so efficiently into small curves and angles.

The knowledge of furniture details and proportions, an appreciation of the refinement of form, and skill in the use of certain tools which the cabinetmaker finds indispensable in the making of furniture, cannot be assumed off hand by even the most competent carpenter or patternmaker, any more than can a cabinetmaker teach so effectively the problems involved in roof framing, or see at a glance the problems involved in the making of the pattern of a globe valve with its core boxes.

Teachers of woodwork occupying positions in teacher training have said they neither recommended nor taught the use of either the block plane, scraper or file, and considered it poor craftsmanship to use the latter tool upon wood, the viewpoint of many patternmakers; few pupils of these teachers will use or teach the use of either of these tools, and in most cases will continue their viewpoint to teachers whom they train and so on *ad infinitum*.

Often the omission of certain tools is defended by psychological or pedagogical reasons to show that the tools are not suitable for the use of children of the grade school ages. In many cases this is true, but usually children who cannot use them efficiently will not be able to use other tools any more skilfully; it is quite as difficult for most students to saw exactly to lines upon adjoining surfaces, and to bore a hole square with the surface as it is to use the block plane, yet the question of eliminating the saw or the bit-brace from the grade school woodwork has never been discussed. Undoubtedly it is more difficult to acquire skill in the use of some tools than in others, but the fact remains that teachers whose technical skill is along the line of cabinetmaking teach the use of the block plane and the scraper successfully.

If the training of the early teacher of machine shop practice had been along the lines of tool making, he taught similar work to his students; the teacher who had made engines, or pumps, or shoe machinery, the machine blacksmith, the shipsmith, and the horseshoer each found his course outlines were largely influenced by the work with which he was most familiar.

The natural result of so many different viewpoints of approaching the subject was a wide diversity of courses, but all that was educationally best of the different types of hand work was thus automatically separated from the rest and adapted for the basis of hand work in teacher's training schools. This has resulted in a type of educational hand work for the grade schools which is excellent prevocational training, as the mental and physical coordinations acquired in the use of the common tools may be transferred to the use of similar tools of different trades; for example, the coordination necessary in using a hammer, a chisel, a bitbrace or a file are practically the same in all metal and woodworking trades.

Because of the many psychological problems involved in the teaching of handwork, access to specific psychological and pedagogical discussion would be of greater value to the ambitious teacher of the manual arts than to the teacher of most scholastic subjects, for in no other subject is it possible to adapt the work so efficiently to the need of the individual student.

Surely within the methods of presentation of different tools, of correlation of the various processes and materials with the scholastic subjects of the school, and the world wide interests involved in every phase of hand work may be found abundant opportunities for the ambitious teacher to improve his methods, if the methods of other teachers in using the same materials and tools were available for inspiration.

Before the teacher of handwork can attain highest efficiency as a teacher he must realize that his personal skill in hand work is of less value to the student than the methods by which the subject matter of the course of study is presented, whether in educational hand work or in vocational training, as the principal benefit to the student will come thru the tying up of his school work with matters of everyday life, thus it is peculiarly the province of the teacher of handwork to stimulate his pupils to an interest all along the line of his school activities.

Life gives nothing to men without great labor.
—*Horace.*

THE "N. E. A." ADOPTS A SO-CALLED "NATIONAL POLICY OF VOCATIONAL EDUCATION"

Arthur F. Payne, Assistant Professor of Trades and Industrial Education, University of Minnesota

THE National Education Association, like most other huge unwieldy bodies, is slow to move and hard to stop, especially when it is moving in the wrong direction—a power for good when on the right track, but ludicrous, tragic or insane as the case may be, if on the wrong track.

The resolutions committee of the recent Milwaukee "N. E. A." convention presented twenty pages of sonorous sounding resolutions in which they exposed to public view most of our national defects and proposed profound remedies, took unto themselves as chief representatives of our great public school system almost all of the credit for winning the late war, and in a few spare moments dashed off "A National Policy of Vocational Education."

The committee was made up of four city superintendents of schools, one state superintendent, one grade school principal and one girl's high school principal, all good-hearted, well-meaning men and women, but not one of whom has ever taken any prominent part in the field of vocational education, in fact some of them are known to be quite lukewarm in their feelings toward vocational education.

When the so-called "National Policy of Vocational Education" was first read before the convention, a copy of the resolution was secured and a hurried caucus of the vocational educators present was held, and it was ascertained that no person working in the field of vocational education had assisted in the development of this "National Policy." Since that time, diligent inquiry has failed to produce any vocational education worker who will admit to having assisted at its birth.

The following sentence (?) will serve to show the sonority and profundity of this epoch-making "National Policy." "If we are to be a homogenous people generally, happy and prosperous, generally living full, rich, contributive lives, the work which we do must continue thru our lives, the development begun in the earlier years, devoted to specific and formal schooling."

After the above effort, the resolution proceeds to lay down the law and principle that industry must be reorganized. Of course, it is out of the question that our educational system might be improved by a reorganization, but we must proceed boldly forth and tell the naughty "Captains of Industry" that they are all wrong and must make over their organizations to conform to the wishes of the "school ma'ams." The resolution states it this way. "To this end industry in this country must be reorganized. All industry must become educational to those who engage in it. The workers must find in their work an opportunity for self-expression and self-development."

Again they continue the thought. "They must find in education realization of their life's purpose in the output of their daily toil and in the sharing in the direction of the policy guiding its production." Finally the resolution states that "Vocational Education must have as its purpose educational industry." That is, we are to abandon our efforts to establish vocational schools, and turn our attention to reorganizing industry.

It is quite evident that this committee is not aware of the fact that our economic success as an industrial nation is based upon "quantity production," that they are acquainted not at all with modern industrial processes or management, that they are still thinking in terms of the "Golden Age" of the "Pre Raphaelities," before iron was melted and machinery invented, when individual craftmanship was at its zenith.

The most tragic feature of the entire resolution is that the committee, proceeding upon the assumption that our present system of schooling is perfect, calmly places upon the advocates of vocational education the slight task of reforming all of our industries so that our people may become educated, leaving us to wonder just what part the schools have, or are to play in this their scheme.

It is quite certain that this well-meaning committee has not followed very closely the recent developments of vocational education under the Smith-Hughes Law, which insists that no training shall be given which is specialized in terms of quantity production methods, but that the student must be taught the science, the mathematics, the drawing of his trade, and that he shall learn all branches of the chosen trade, thus giving a broad all-round training that is in many ways superior to the old apprenticeship system.

Furthermore, the committee in its report, has taken cognizance of only one phase of vocational education namely, industrial education. They have not mentioned agricultural or home economics education in their "National Policy." Neither have they mentioned commercial education which in certain types of classes receives federal aid under the vocational education law. Are we to suppose that the committee considered agricultural, home economics and commercial education of so little importance that they were not worthy of mention or consideration, or is it possible that the committee were not aware of the fact that these three forms of vocational education come within the scope of the Smith-Hughes Vocational Education Law as much as does trade and industrial education?

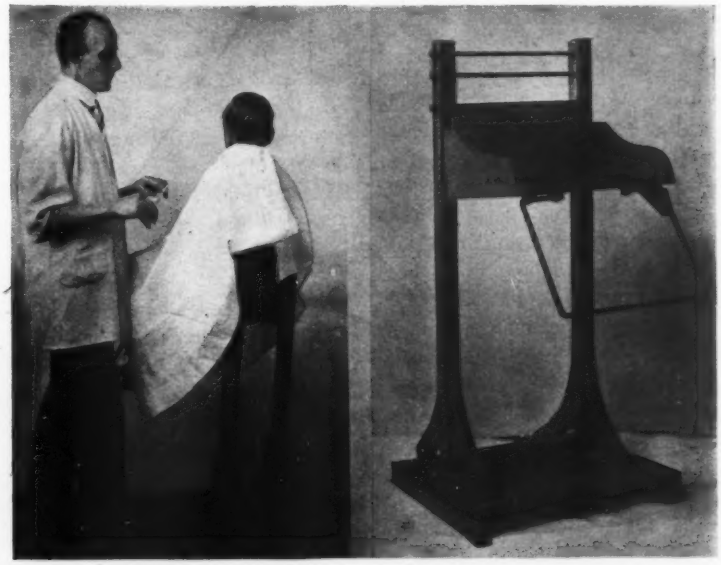
In justice to the committee the resolution in its entirety is given, the italics are mine.

A National Policy of Vocational Education.

A high standard of intelligence, general vocational efficiency, physical and moral fitness and civic devotion are not only dependent upon an efficient system of public education of all our youth, but also upon the reaction upon human values of the occupations in which the people of the nation engage. *If we are to be a homogenous people generally, happy and prosperous, generally living full, rich, contributive lives, the work which we do must continue thruout lives, the development begun in the earlier years, devoted to specific and formal schooling. To this end industry in this country must be reorganized. All industry must become educational to those who engage in it. The workers must find in their work an opportunity for self-expression and self-development.* Human, not commercial value, must be placed first in our great industrial establishments. The rank and file of those who produce wealth must, thru their organizations share in the control of the policy of the institutions for whom they work. *They must find an educative realization of their life's purpose in the output of their daily toil and in the sharing in the direction of the policy guiding its production.*

Vocational Education must have as its purpose educational industry. Inasmuch as the general policy of Vocational Education in this country is directed by those responsible for the administration of the Smith-Hughes Law, we urge those thus responsible to adopt such a policy in interpreting and administering this law that the above named ends may be furthered by the system of vocational education now developing under this law; namely in the schools and departments organized under the Smith-Hughes Law shall be made competent as far as humanly possible for sharing in the control of the policy of the institutions in which they may afterward be employed and "That they shall be inspired, so far as humanly possible with an impulse to continue their education thru the instrumentality of the occupation for which they may be trained, and in which they may be afterward engaged.

It is deeply regretted that an organization of the prestige and power of the "National Education Association" would in the hurry and scramble of the last few minutes of its sessions adopt such a poorly drafted, ill advised, inadequate resolution as that expressed in its so-called "National Policy of Vocational Education." It is quite possible that in such actions as this, one may find the real reason for the rapid development of the "National Vocational Education Association" and the increasing importance of its sessions.



Barber Chair made in the Manual Arts Department of Kenosha, Wis. The chair illustrated was made to fill a rush order for a chair to be used in the social service department of a school in the poorer section of the city. It is adjustable as to height and has given complete satisfaction.

INDUSTRIAL-ARTS MAGAZINE

Board of Editors
E. J. LAKE S. J. VAUGHN
W. H. HENDERSON

EDITORIAL

"PRACTICAL EXPERIENCE."

THE insistance upon "practical experience in the trades" for teachers of manual training in the elementary schools has been rather overdone in some quarters.

Practical experience is a good thing to have, but this alone by no means insures even *ordinarily* efficient teaching. On the contrary, for the first year or two, at least, the man with only his "practical experience" usually makes fully as bad a mess of his teaching as the school trained man would make in practical trades. And the cost and damage are infinitely greater, because he is experimenting on boys who have but one life to live and can't be made over or repaired.

A case is reported where a man was employed to teach printing because of his "practical experience". It developed that all the experience he had had was the feeding of a cylinder press. And he undertook at a good salary to teach eighth grade boys how to lay out a job, set type, pull and read proof, edit a paper, and run a job press—matters in which he had had absolutely no training or experience!

Another case is where a man was taken from a furniture factory where he had been simply a machine operator, and was put to trying to teach benchwork to seventh grade boys on the salary schedule of highly trained and efficient teachers!

Besides the fact that in such cases the practical experience had furnished absolutely no preparation for the positions accepted, there is another very important consideration. Frequently, the practical man has had but very limited educational advantages, so that his contact with the boys in the elementary school tends to nullify the influence and construction of the academic departments. The spirit and intent of this statement are in no way derogatory to the men in question. The whole matter is being discussed from the standpoint of the *efficiency of the teaching* of manual training in the grades.

We do not in any way undervalue or minimize the importance of trade experience, *provided* the trade experience is of such character as to give definite preparation for the school work undertaken, and provided further that the prospective teacher has *other qualifications* fully as essential, and we think *more* essential, in the work of the elementary schools.

When it comes to the advanced and trade courses, it is very essential that the teacher have in addition to his skill in class management, instruction, etc., a high degree of technical knowledge and skill acquired in the trade itself. But let us not forget that there are other considerations in the elementary school of vastly greater importance than skill, technical process, or trade proceedure.

We are all longing for an increase of that rare type of individual of fine personality who combines happily the skill of the teacher with the skill of the tradesman. But there seems but little hope so long as the employers of teachers maintain the present disgracefully inadequate pay schedules.

IN WHAT CONDITION DID YOU FIND YOUR SHOP?

As schools begin to open, we shall begin to reap our annual harvest of letters complaining of shop conditions found by teachers on beginning work in new places.

Each year we receive detailed descriptions of conditions found that would seem almost impossible to believe, had we not witnessed similar conditions in years past. They complain of dilapidated shops, abused benches, broken and ill-used tools, of piles of tools, unfinished articles, scraps of lumber, and debris in the corners, and a general state of untidiness and confusion.

It is a serious reflection on our teachers if any large number of them are guilty of leaving for their successors, such tasks as these descriptions would indicate.

It would be worth while to photograph especially bad situations found this fall. We shall be glad to receive such photographs for publication in an effort to find a remedy for this annoying and unprofessional practice.

TEACHERS' TROUBLES.

THE editors of *The Industrial-Arts Magazine* have received some urgent letters during the past few months on two topics.

We believe these topics are in a way related.

One topic is of general concern: "The need of increased pay for teachers." The other topic which we fear is not of such general concern but which we believe is dependent on the first, is "The improved professional standards of teaching."

Having experienced and observed for the best part of our lives the teaching profession under small salary as compared to other professions we are prepared to make a confession.

We recall when teaching was but the stepping stone to a profession and our own youthful intentions were to teach only long enough to take the opportune step. Having missed that step to another profession and having committed ourselves to teaching out our existence we are as urgent as teachers can be for better salaries and higher standards.

The two leading professions of Law and Medicine have been raised in standard and income by the successful efforts of organizations in these professions affecting legislation making it prohibitive to practice without

license by state authority. The most significant point with regard to this improved condition of Law and Medicine is that the standards of entrance to these professions are raised above examination by the institutions that prepare for the professions.

A diploma from a school of law or medicine is not accepted as a certificate to practice.

Teachers' salaries have been raised materially this year thru the absolute necessity of supplying the demand for teachers in competition with employments that pay better, but standards already low have been lowered to meet this demand. The situation is one that demands the attention of every professional teacher.

We believe that the proper education of our people depends on the substantial raising of standards in the profession of teaching and we believe that this can only be effected by organized effort directed toward legislation that makes it prohibitive to teach without adequate preparation. The salary question is related.

A high professional standard will bring with it higher salaries, but a nominal increase in salary without higher professional standards is inadequate, if not positively destructive.

WHY IS A DIRECTOR?

MOST of the states have now gone through some sort of a form of adopting vocational education. In looking over the list, one is struck by the surprising frequency with which the states have chosen for the vocational directors, men who are in no sense trained in vocational education and whose previous attitude and experience give but little comfort to those who are most anxious for some genuine vocational education to be developed in the various states.

It seems pertinent to ask whether the establishment of the position of Director of Vocational Education in a state ordinarily means simply the creation of another office to be filled in the usual way.

Is it too much to ask that state directors of vocational education or banking or farming or what not, shall have some knowledge, training, or experience that will qualify them in some degree for the definite business which they are supposed to direct?

THE ADMINISTRATION OF VOCATIONAL EDUCATION.

ON the whole all education is vocational in part, both as to content and as to purpose. The education that does not ultimately articulate with some worthy occupation or vocation or profession is lacking somewhere. It does not follow that every individual who studies a subject must study it because of a so-called "bread-and-butter-interest," but it is probable that no subject could long exist that did not function vocationally for some individuals.

And so, in the administration of vocational education, the most essential condition to provide is one where each individual may have the widest possible latitude in selecting from the varied educational opportunities those which may serve him best. In order to facilitate freedom of selection it is necessary to break down some of the ancient barriers and prejudices peculiar to what is so often referred to as "traditional education." These barriers are particularly high and strong in some of our high schools which, in fact, offer many differentiated courses but shut away from these courses many who could make excellent use of them or of portions of them if permitted to do so. The difficulty is that "tradition" and "standards" stand in the way.

And so, in the administration of vocational education, it is most desirable to provide for an official to order and direct the work who has a place on the superintendent's staff, preferably with the rank of assistant superintendent. Such an official, if he has a working knowledge of vocational education, will have ample opportunity to so open the doors of the people's schools that many who need vocational education may take adequate advantage of the rich offerings provided by a modern school system, ample in many instances for all the vocational education needs of the community.

I believe that the elevation to the rank of assistant superintendent of one able to direct vocational education and the vesting of this assistant with large administrative and advisory authority is the next and most necessary step in the development of the administration of vocational education.—*Frank M. Leavitt.*

THE new world into which we are now entering will be a world of experts. The war, more than any other experience we have passed thru, has proved the advantages of training. In the improvised armies of the world the undertrained man has been carried as a dead weight and we have begun to see that society must carry the ignorant as so much handicap for the educated.—*Prof. John Erskine.*

WE must cancel dread traditions about our teaching of Art and approach the subject in the same fair-minded manner that all other subjects are approached. We must denounce the idea that Art is a fad or a frill and accept it as man's natural, normal, necessary inheritance. We must educate more Art teachers and fewer "drawing teachers," keeping in mind that Art is a quality of consciousness, that the understanding of it, the appreciation for it, and the personal reaction to it by a nation means individual possession of that quality in personal consciousness.—*Frank Alvah Parsons.*

Industrial Education. **Bulletin No. 30, National Society for Vocational Education, New York. Contains papers on trade tests, unit and general industrial schools, teacher training, etc. The contents were presented at the St. Louis Convention.**

The girls' camp **at North-Way Lodge, Algonquin Park, Ont., Canada, during the summer, erected a council house. The structure was built largely from local materials and is said to possess many features of interest to teachers and supervisors of industrial arts.**

HOME WORK IN HOME ECONOMICS

Mrs. Vera B. Tice, Instructor, Glencoe, Minn.

CORRELATION between home and school work in home economics is one of the most necessary, and at the same time, one of the most difficult factors in the work. The following suggestions have been carried out in two schools in the past four years and have been found successful.

First of all, "home reports" were required every six weeks from each girl in the high school taking cooking. These reports consisted of a list of the things cooked during that time and an outline of the housework done, and they were signed by the mother or by the woman in whose home the girl lived, if she worked for her board. Fifteen per cent of the six weeks' standing was allowed for these reports. After this plan had been tried for a year it seemed best to require every Monday morning a report of the work of the previous week, so that a more accurate account could be kept.

In the grades it has not seemed feasible to ask for so complete a report. Usually all that is required is a list, signed by the mother, of the things cooked during the month, with the date of each and the number of persons in the family. A part of the month's standing is given for this work. In the case of conservation breads and the like, a requirement was sometimes made that this particular dish appear on the list, the recipe having been used in classwork previously.

In order to keep in touch with the vacation work of the pupils, the instructor in each of the special departments of the high school at Warren, Minnesota, made out a list of home projects for which, when completed, regular high school credit would be given. Our object in submitting these projects was not to reduce in any way the regular course but rather to enable students to graduate with more credits. Special certification was made on the diplomas of those graduating with home credits extra. The projects were made sufficiently difficult so that each pupil who undertook them felt that she had earned her credit even more surely than she would have in a regular high school class. Enrollment blanks were printed and given out before school closed to those who planned to carry on the work. This blank stated the project being undertaken and was signed by both pupil and parent, then returned to the instructor. At the completion of the project, it was signed by the instructor and returned to the pupil as a certificate.

Experience being the best teacher, there are some projects which would be altered in offering them again. For example, the credit for bread making would be increased in order to encourage home bread making. The projects are quoted here, however, as first given:

1. Preparing one meal alone daily for three months. At least one-third of these must be dinner. For this report, give menus for seven breakfasts, seven dinners and seven suppers.

2. Preparing three meals alone daily for one month. For this report, hand in menus for any seven successive days.

3. Baking bread once a week for four months, or twice a week for two months. Write an essay of not less than five hundred words on bread-making in general and your work in particular.

4. The care of two bedrooms for four months: sweeping, dusting, bed-making, etc. A three-hundred-word essay on the work done is required with this project.

5. Cooking meat 40 times in at least twelve different ways. Write a two hundred word essay on the best methods to be used with the tougher cuts of meat.

6. Making fifteen cakes, fifteen pies, fifteen batches of cookies, and fifteen puddings. Doughnuts may be substituted for any five of these.

7. Making one dress, one waist, and one undergarment, or one dress, one skirt, and one undergarment, or one dress and three undergarments.

With each piece, keep account of the cost of all the materials used, and give this in the report.

8. Making three children's dresses and one waist and one undergarment for a grown person. Accounts must be kept in this case also.

9. Canning 50 jars of fruit. At least 30 must be plain canned, in quart jars; the rest may be jams, preserves, or jellies in pint or quart jars or jelly glasses.

10. Canning 25 jars of vegetables by the cold pack method, in either pint or quart jars. (Tomatoes will not be included.)

1. The sole care of the living room and dining room for a period of three months. This must include not only the daily and weekly cleaning, but the ironing of the table linen and the cleaning of the silver, which must be done once a month. In the report, give a careful outline of your work, tell the methods used for cleaning the silver, and make a special note of the floor finish and your method of caring for them.

The results of the first year's work were very pleasing. In a high school of about 140 pupils, 45 girls enrolled for the various projects: ten juniors, eighteen sophomores and seventeen freshmen. Two hundred twenty projects were completed and accredited, about twenty of them receiving one-fourth and the remainder one-eighth credit. The following figures will show the results of three of the strongest projects: twelve girls completed No. 9, canning fifty jars of vegetables; seventeen completed No. 3, baking bread sixteen times; seven completed No. 10, canning 25 jars of vegetables. Such practice in the home can scarcely be over-estimated. One of the most pleasing results was the fact that about 25 of the girls who took up the work did not need the extra credit. Nine of the juniors had either a half, or a whole, extra academic credit before they enrolled for the projects.

There is no doubt but that much of the value of home economics is often lost thru failure to follow school by practical home work. To encourage active cooperation between the school and the home, and to apply the training in school directly to the home, is the object of each of the suggestions for home work offered here.

VOCATIONAL EDUCATION AT THE N. E. A.

Vocational aspects of education received considerable attention at the Milwaukee Convention of the National Education Association, June 30 to July 5. Ample cause was given by a number of the speakers for the repeated charge that the average schoolman has a very limited understanding of the vocational courses or of the philosophy and the aims of the men and women engaged in the vocational courses.

The convention had as its fundamental topic the reconstruction of education during the post-war period and devoted much time to the service of education in the new democracy, the need for nationalization of education and the reorganization of the N. E. A. on a representative basis. The last mentioned proposition failed thru the activities of classroom teachers who favor the present plan of organization.

Resolutions Adopted.

The resolutions adopted by the association contain an astonishing section on vocational education. It reads:

A National Policy of Vocational Education.

"A high standard of intelligence, general vocational efficiency, physical and moral fitness and civic devotion are not only dependent upon an efficient system of public education of all our youth, but also upon the reaction upon human values of the occupations in which the people of the nation engage. If we are to be a homogeneous people generally, happy and prosperous, generally living full, rich, contributive lives, the work which we do must continue thru our lives, the development begun in the earlier years, devoted to specific and formal schooling. To this end industry in this country must be reorganized. All industry must become educational to those who engage in it. The workers must find in their work an opportunity for self-expression and self-development. Human—not commercial—value must be placed first in our great industrial establishments. The rank and file of those who produce wealth must, thru their organization, share in the control of the policy of the institutions for whom they work. They must find an educative realization of their life's purposes in the output of their daily toil and in the sharing in the direction of the policy guiding its production.

"Vocational Education must have as its purpose educational industry. Inasmuch as the general policy of Vocational Education in this country is directed by those responsible for the administration of the Smith-Hughes Law, we urge those thus responsible to adopt such a policy in interpreting and administering this law that the above named ends may be furthered by the system of vocational education now developing under this law; namely in the schools and departments organized under the Smith-Hughes Law shall be made competent as far as humanly possible for sharing in the control of the policy of the institutions in which they may afterward be employed and that they shall be inspired, so far as is humanly possible, with an impulse to continue their education thru the instrumentality of the occupation for which they may be trained, and in which they may be afterward engaged."

The educator who would defend the preceding theory before a group of business men or even the general public would have an interesting, if not a quiet, time.

The Vocational Section.

The Vocational and Arts Department held a short session under the chairmanship of Prof. Arthur F. Payne of the University of Minnesota. Mr. John Callahan, state supervisor of Wisconsin described the vocational school system of Wisconsin and discussed the dual system of control which is in vogue. He made clear the progress which has been made in the all-day and part-time schools and the continuation schools.

Mr. R. L. Cooley, director of continuation schools for Milwaukee, described as the American educational desert the life period between 14 and 17 years, of those children who must work. He declared that it pays educationally and from the civic standpoint to work in this desert, to take the children where they left off in the grades and to carry them forward so far as the continuation school is able. He argued that the cost of continuation schools because of the special organization and methods does not merit adverse scrutiny for the reason that the regular schools spend far more on children who are able to attend and those children who are at work are entitled to the same consideration.

Mr. Clifford Connolly, State Commissioner of Trades and Industries for Pennsylvania declared that the continuation school has come to stay because it stands for opportunity for the children of the poor equal to the opportunities open to the children of the rich.

The main business of the session consisted of the consideration and adoption of a series of resolutions. The resolutions of which an outline is reproduced below involve important details requiring present study and action:

Mr. President:

Vocational Resolutions.

1. Believing that the vocational related work consisting of science, mathematics, and art, taught in relation to social needs as all these subjects should be, fundamental in the development of vocational education.

Be It Resolved, That a committee be appointed to work out a constructive program for instruction in science, mathematics and art related to the study of agriculture, trade and industry, home making, and commercial subjects.

This committee shall consist of a chairman and four members representing respectively the four fields of agriculture, trade and industry, home making, and commercial subjects. Each of the four members shall invite two specialists in the same line of work to cooperate in the development of this program.

2. *Be It Resolved,* That a committee of five be appointed to report at the next annual meeting of the N. E. A. for the purpose of gathering information concerning part-time education, and to draft this information in such shape as will be of aid thruout the nation in establishing part-time schools. Such material will show the aim of part-time education, methods of organizing the work, courses of study and programs of the work.

3. Appreciating the necessity for laying a foundation for both home making and wage earning pursuits in the education of girls from fourteen to eighteen years of age, *Be It Resolved,* That a committee of five be appointed composed of experts in home making education and in the education of girls and women for wage earning pursuits for the purpose of outlining the best kind of program possible for the education of girls in this period of life.

4. Realizing that education for trade and industry, and education for home making have essential differences in their aims and methods, *Be It Resolved,* That we endorse the proposed congressional legislation to separate these two lines of work as at present administered under the operation of the Federal Law for vocational education, so that each may develop in its own way with its own funds, and be able to freely cooperate with the other to the largest interests of both.

5. *Be It Resolved,* That the members of the Vocational Section of the N. E. A. commend the action of the Federal Board in reimbursing part-time commercial work.

Be It Further Resolved, That it is the hope of this section that a still broader interpretation of the law will permit a wider use of Federal funds for advancing the interests of commercial education.

6. *Be It Resolved,* That it is the opinion of the members of the Vocational Section of the N. E. A. that night school classes, which are made up of at least three-fourths trade extension students, the remaining number being trade preparatory students, be Federal aided.

The Section elected as its officers for 1919-1920:

President—John Callahan, State Supervisor of Industrial Education for Wisconsin, Madison, Wis.

Vice-Presidents—Miss Cleo Murtland, Assistant Professor of Trades and Industries, University of Michigan, Ann Arbor; Mr. Z. M. Smith, Supervisor of Agricultural Education, Indianapolis, Ind.

Secretary—Arthur F. Payne, Professor of Industries and Trades, University of Minnesota.

COOPERATION BETWEEN THE PUBLIC AND THE SCHOOLS IN TAKING ADVANTAGE OF THE VOCATIONAL EDUCATIONAL BILL.

The general public is heartily in favor of almost any type of vocational education, as they see in it an opportunity to make the work of our schools more purposeful and practical, more rational and real, more in harmony with life and living.

Manufacturers and businessmen are among the most earnest advocates of vocational education. As the agriculturists want agricultural education, so the manufacturers want industrial education, and the businessmen commercial education. The Smith-Hughes Law makes provision for all three types and also for education in home economics.

The large and growing class of labor union men is perhaps the most earnest advocates of all forms of practical education; they see in vocational education an opportunity for a worth-while education for the children of the poor people that will equal the opportunities for a classical education now offered the children of the rich people.

There is still another small but influential group of people who will support any movement towards establishing vocational education. This group is made up of those interested in the sound betterment of the poorer classes: social settlement workers, philanthropists who support these settlements, sociologists and social workers of all kinds. This group of splendid people in their endeavor to develop and educate for "good citizenship" has found that the basis of good citizenship is the ability to earn an adequate livelihood, all else follows, and nothing precedes this.

The first step then, in any plan for cooperation should be that of an educational propaganda for a clear understanding of the principles and purposes of vocational education. Many educators oppose vocational education because they do not understand it, and therefore are afraid of it. Many of them see in it a danger of losing their position and life work. For this group our message is that vocational education needs the very best they have to give. They talk and write about correlation, motivation, unification of schooling with life and environment. Vocational education offers this in its finest form. They enthuse about "education for democracy." Vocational education is the democratic leaven in an aristocratic educational system. Our present system of education is aristocratic in that it offers its benefits only to those wealthy few who can afford to go thru high school and graduate from our colleges and universities. With more than sixty per cent of all the children in this country leaving school before the end of the sixth grade, we can hardly claim to be educating the mass of people.

The second step should be the appointment of an advisory committee of representative citizens; all of the state laws with which I am acquainted require this. The purpose of this committee with its necessary sub-committees is to do research work, formulate plans and make recommendations to the school board and assist them in making campaigns for buildings, money, equipment, etc. The membership of this committee should represent the leading activities of the town in proportion to their importance, agricultural, industrial, commercial and home economics, in every case home economics should be represented.

Next should come the survey of the schools to discover what training is being offered for these vocations. You will probably find that private schools offer more training for the vocations than the public schools, but this will not concern us as the Smith-Hughes Law gives aid only to schools under public control.

There should also be a survey of the public school records to show the per cent of pupils retarded, the loss by grades to go to work, per cent of those who enter high school, who graduate from high school, who enter college.

Finally, in all of this work we must at all times keep clearly before us the ultimate aim of vocational education, which is the greatest good possible for the youth of our land. Good citizenship, recognizing as we all do, that ability to earn an adequate livelihood is the basis for good citizenship. The particular group of children we are working for are mostly the children of that splendid body of workers who are the backbone of this great country of ours, so at all times we must be sympathetic, generous and open to conviction, working only for that untold good that will come from an effort to increase human efficiency and happiness, which will bring its own reward and blessing to those who work for that end.—*Arthur F. Payne, Professor of Industrial Education, University of Minnesota.*

REORGANIZATION OF THE HIGH SCHOOL

The American high school must henceforth mobilize the entire youth, not a selected portion of it for the service of democracy in peace. It must take every boy and girl from 13 to 18, discover his aptitudes, his ability by a system of intelligence tests, and give him a training which shall so enlist his interest that he shall develop a habit of success, not failure. The supreme task of the high school is to abolish the long established, cheerfully accepted habit of failure.

Boys and girls alike have one vocation in common, that of citizens in a democracy—soldiers of the common good. During the past months we have learned as never before that the supreme good is a good government. In America we have assumed good government to be a free good, obtained without effort, without sacrifice. We now realize that good government is the product of good citizens and good citizens are produced only by good training. Whatever else it may do, the American high school must give every one of its students a definite training for the duties of the citizen. He must study the operations of government, local, state and national; the economic forces which dominate our industrial life to which the actions of government are but the reaction; he must study the events, movements, measures and men which have made America what it is today; and in the realization that we in America are no longer isolated, he must study the makings of the Europe of today. Unless our high schools insist upon these studies as a minimum for all, we shall not equip our boys and girls for service in a democracy.

The war has impressed upon us the need of specific training for participation in the governing of functions. It has shown us the need of longer training as well as of more intensive training for industry. Labor unions and employes are coming to favor the postponement till a later age of the entrance of the boy or girl into industry. New York State requires hereafter that the boy or girl must attend a school at least part of the time till he is 18, unless he be a high school graduate. With the growth of such public opinion, 18 will tend to become the minimum age for leaving school.

With an earlier entrance into high school, probably at 13 years as the result of testing and grouping and with an increase of the age of leaving to 18, the high school will have a period of five years for its training, the most important in the child's life. The inevitable outcome will be the combined high school and junior college on the one side and the higher commercial and technical school on the other which will train the youth for supervising positions in the commercial and industrial field.

The continuation classes of high school grade for workers who are not high school graduates should become a vital part of the day high school. Like the evening high school of the present, it will then find it incumbent upon itself to minister to the needs of any considerable group of students who are engaged in a given industry or have a common aim in view. To meet the needs of the workers, the high school will thus extend its sessions and become the all-day school with changing relays of teachers. It will then be what has been heretofore a prophecy—the "peoples' college."—*John L. Tildsley, Asst. Superintendent of Schools, New York, N. Y.*

THE NEED OF CONTINUATION SCHOOLS.

We need technical schools. We need continuation schools which children shall desire and not dislike. I am sure we are on the road at last to the right kind of school. The German plan of class industrial and continuation schools was laid before the war, and now we may believe its ghost will never walk in our land. No one can read without emotion the insistence of the English Labor Party and of Mr. Herbert Fisher, head of the education board, that the continuation school must give culture, not mere trade skill.—*Julia C. Lathrop, Chief of the Children's Bureau, Washington, D. C.*

A STUDY OF MECHANICAL DRAWING IN OHIO HIGH SCHOOLS.

The recognition of the need of standards in industrial and manual arts subjects has been expressed in a practical manner in two recent studies of mechanical drawing. The earlier of these was made last fall and winter in Chicago by the combined teachers of the thirteen city high schools and has resulted in a splendid new course of instruction. The second was a state wide study led by Professors T. E. French and Carl L. Svenson of Ohio State University and extended to the high schools of the Buckeye state thru a questionnary. Both studies found that mechanical drawing has lacked in unity of purpose and presentation, in content and method. Both agreed that standardization is needed to give the subject the standing to which it is entitled as a cultural and practical subject and as a real language. Some of the chief findings of the Ohio study are reproduced here because of their general interest and suggestiveness.

Purpose of the Course.

Professors French and Svenson found that while the purpose of mechanical drawing courses is apparently misunderstood it is very clear and definite and can be readily expressed. They write: "There is no place in the present day educational program for any study which cannot prove its value and which does not have a definite purpose. The ease of using or directly applying a small knowledge of mechanical drawing is so evident in comparison with other subjects that there is a tendency to obscure its larger purpose and it is actually mistreated on this account. This danger must be kept in mind if the possibilities of Mechanical drawing are to be realized.

"The purpose of a drawing course is not simply to make draftsmen, it is not simply to obtain college credit, it is not simply to learn how to represent an object to be made in the shops, nor is it simply to learn to read blueprints. However desirable these things may be in themselves, no one of them nor even all of them can be taken as the main purpose of mechanical drawing as an educational study. They are some of the visible and directly valuable results of such a study. The main purpose of a course in mechanical drawing is to train the pupil in the greatest of all languages, the graphic language.

"The teacher should have this purpose in mind when arranging the content of the course and its various divisions. The use of instruments is simply a means to an end, they are used for writing the graphic language, as the pencil or pen are used in writing English or French. A good "hand" should be developed, starting with the "alphabet of lines" and carried thru "reading" and "writing" graphically. The power of "visualization" should be developed soon after the power of "description" has been developed. Drawing as a means of developing ideas is unsurpassed, but it must be taught in logical manner. Each part of the course must bear a definite relation to the other parts. Drawing is an exact mode of expression and requires exactness in representation and exactness in thought."

Content of Courses.

The important question of content of courses is too often met by using miscellaneous models and drawing studies without regard to their teaching value. On this point the Ohio surveyors remark: "In the question of content in a well planned course, it is not so important just what individual problems are included as it is to have each problem selected so as to apply primarily one definite principle, and to have the order of problems so carefully arranged that the principles follow in a logically determined order.

"For this reason the group system of classifying problems is advised. By this arrangement the brighter pupils are assigned harder problems, while the slow thinkers may be given easier ones.

"In considering the language of drawing the two important things in the description of an object are its shape and its size. The natural grouping of the elements leads to arrangement in grand divisions or parts.

"A.—*A study of the instruments, materials, etc., and* their uses. It should be emphasized that this is preliminary to the study of the subject. Good form should be taught at the beginning and constantly insisted upon. Problems for this purpose should be selected to bring out the possibilities and limitations of the various instruments, tools and materials. There are many drawings which can be made with the scale, the T-square and the triangles. The proper use of the scale, the number of operations involved, the position and handling of the T-square and triangles are questions of good form and are teaching points having direct educational value. Lettering should be introduced early in the course, with careful criticism of the forms of the letters and their combinations into words.

"B.—*A study of the theory of shape definition.* This is the division requiring the most careful thought. The shape is of course described by projections and here orthographic projection must be treated adequately, first as different views, without reference to the planes of projection, but followed very soon by the demonstration of the third angle. The ability to think in three dimensions, to get a clear conception of surfaces variously arranged with respect to one another and their position in space, presents difficulties for the pupil not always realized by the teacher. The apparent simplicity of orthographic projection when applied to a single rectangular block is deceptive. For this reason a nice balance of theoretical and practical subjects is necessary in order to secure the proper training, altho the pupil need not know that he is studying theory, and indeed, the words *orthographic projection* need not be used in class at all.

"As to problems for shape study, the progression should be—drawing from models, from pictorial views, supplying missing views or other views and from verbal description. Type solids can be used to a limited extent, but real things should predominate. Much of the study of shapes may be done by freehand sketches in order to save time.

A RED CROSS HUT BUILT BY MANUAL TRAINING CLASS AT WINSTON, ARIZ. MR. RAY F. GLENN, INSTRUCTOR

"The change from the usual two dimensional thinking to space conception is more radical than generally assumed and particular efforts must be exerted to use subjects which will enable the pupil to get away from thinking in 'the flat.'

"A study of shape definition includes the representation and visualizing of the elementary solids and their various combinations in natural and in out-of-the-ordinary positions; the representing and visualizing of the invisible parts and a clear understanding of the meaning of such representation; the representation of the interior of objects and combinations of objects by use of conventional cutting planes.

"The number and choice of views as well as their arrangement should be studied and analyzed. Problems should be selected which will cover these points and in such a way that there will be an easy transition from one to the other until the subject as a whole is worked out.

"C.—*A study of the elements of size definition.* There is a certain lack of definiteness in the subject of dimensioning which causes it to be neglected as a grand division of mechanical drawing. It is generally treated by giving a list of rules without a complete exposition of the rules and their application. This subject should be classified as completely as orthographic projection and problems in dimensioning should be given to illustrate the elements. From the sizing of simple objects the problems should lead to combinations, with an orderly procedure of work. The systems of dimensioning should be taken up and advantages and disadvantages discussed. Dimensioning should be applied to wood, castings, forgings, and sheet metal. At the same time the machines used in the industries should be described and the operations which are performed on them with the materials used for different purposes, should be explained. This is just as necessary for the making of intelligent drawings as for shop courses.

"D.—*A study of the application of the preceding divisions to practical drafting.* This involves the presentation of the various kinds of working drawings, detail and assembly drawings and their relation to each other. The source and path of a set of drawings should be followed out. The conventional practices of the drafting room should be explained and their uses studied and applied. The reasons for the existence of such conventions is a part of this study.

"Intersections, developments, cams, gears and similar position and area problems can be taught and understood best after the elements of space and size description have been thoroly mastered.

"An added interest and value in sheet metal pattern drafting can be had by building paper models from the patterns as worked out in intersection and development problems.

"In preparing a course in mechanical drawing the teacher should bear in mind that he is beginning a subject of unlimited scope and should seek an outline having as logical and definite a sequence of divisions as any other subject. The initial enthusiasm of the pupil should be utilized and a feeling of respect for, and appreciation of, the wonderful possibilities of the graphic language should be developed as early as possible.

The Character and Selection of Problems.

According to the findings of the Ohio study the source and selection of problems is a most important factor in maintaining the interest of drawing classes. "There are many kinds of problems, theoretical and practical, but the true test of a problem's value is what it teaches. The points to be taught should first be listed and problems sought which will satisfy the conditions.

"The method of presenting the problem is fully as important as its selection. Every problem must have a reason for use and should be presented in the manner best adapted to develop the lessons to be learned from it.

"As mentioned under the discussion of shape definition, a problem may be presented in the form of a model or casting, to be measured and drawn. In this case it becomes a problem of shape or shape and size description, involving the choice of suitable views, selection of proper scale, and decision as to the best method of representing the piece so that all the information concerning it is given in the clearest and simplest way. A problem presented as a pictorial sketch has the same teaching points. When given in the form of orthographic projection, with missing detail or other views required, it requires more effort of the constructive imagination to visualize the object before the solution can be made. This exercise in reading is also had when orthographic views are given to be translated into pictorial views. Problems given by verbal description are used to a limited extent to test the ability to translate from ordinary language into graphic language.

"A good problem should: (1) Illustrate primarily one important feature of the language of drawing, a feature which will recur incidentally on subsequent drawings.

"(2) Take its place in the scale of difficulty.

"(3) Contain a minimum of repeated detail.

"(4) Be an object with whose form, use or place the ordinary boy would be familiar.

"(5) Not be obsolete in design.

"A Progressive instructor will find many sources of problems. Shop blueprints and castings are always available; the different textbooks contain many suggestions of tested problems; the engineering and vocational periodicals are a ready source of good suggestions both in their reading content and in the advertisements.

"It should be understood that the theory of orthographic projection so often referred to thruout this bulletin, is not limited to the representation of type solids in natural and revolved positions, but that it is the basis of all constructive drawing. There is sometimes a tendency to give too many problems in revolution under the mistaken impression that they are necessary for teaching purposes. The representation of machine parts and details of construction requires just as careful study of the laws of projection, with the added advantage of being practical and interesting."

Textbooks.

Space will hardly permit a discussion of equipment such as Professors French and Svenson present in a most helpful way. They urge that the equipment be as practical and complete as possible and that it equal the equipment used in commercial establishments.

In discussing textbooks they write: "With the conception that drawing is a real language, a subject with cultural value, to be studied and taught in the same way as other subjects there seems to be little argument as to the desirability of using a suitable textbook with the class. No one probably would advocate teaching algebra or latin by giving out notes, yet in many instances drawing is taught using only a set of blueprinted problems, with no text or reference books. However well the teacher may be able to present his problems and bring out the teaching points by lecture and individual instruction, the fact remains that the pupil cannot absorb and retain them all. Much valuable time used in repeating instructions can be saved by the assignment of study and reference work from the textbook. The pupil who has been absent is not left hopelessly behind if a textbook assignment covering the work missed is given him. The teacher's efficiency is greatly increased.

"A textbook should be more than a collection of problems. It should present the subject matter in a clear, orderly and logical arrangement of the divisions, explaining why each rule or custom is made, and illustrating with examples representing good modern practice."

The Problem of Recitations.

Recitations as such are neglected in mechanical drawing classes and their absence fails to bring out important short comings in teaching. "It is not uncommon for pupils to do good work as far as finished drawings are concerned without learning the principles involved. One of the criticisms which can be made on the usual high school course is that while the pupils can make a drawing of some degree of complexity, they cannot read a drawing of the same complexity when made by someone else. In this connection valuable use can be made of some forms of pictorial representation as a means of interpretation of the orthographic views. In this way

the ability to visualize is strengthened and the points which need further explanation are brought out. Short, live recitations serve to fix the purpose of the subject. Oral exercises, sketches, home drawings and blackboard work are all valuable and efficient methods of teaching drawing and form the basis for recitations. The ability of the pupil to pick out a single part from a complex assembly and make a picture of it is a good test of his ability actually to read a drawing."

Examinations and Grading.

Professors French and Svenson urge that mechanical drawing follow the practice of tests and examinations as is customary with other subjects. "Examinations in drawing give an opportunity of finding out what the pupil really knows, of checking up on the speed with which he can think and work, and are most excellent tests of the teacher's efficiency in handling the subject.

"More than once we have heard the remark—'How can you give an examination in mechanical drawing?' Such a remark would indicate either a lack of appreciation of the reason for the subject, or a lack of resourcefulness. Many questions will arise in the pupil's mind in preparing for an examination and the explanations furnish a very good opportunity for reviewing the subject as a whole.

"An examination may include some definitions and written answers, but the principal part should be the making of pencil drawings selected to test the pupil's knowledge in reading and writing the language.

"For economy of time the method is advised of having the student work directly on sheets furnished, upon which the problems have been stated in the form of partial views or in other ways laid out to save unnecessary work.

"The importance of careful checking and grading of drawing sheets cannot be overestimated. Any problem worth giving, is worth careful grading and this important part of a teacher's work should not be overlooked or slighted for the more interesting work of preparing, assigning, and teaching. Altho the drawing is made under the supervision of the teacher as he circulates about the room, it will not be handed in correct in all points. It should be checked as a drafting room checker would do it, criticised, graded on a definite basis and sent back to the pupil for all corrections. This should be done as soon as possible in order to secure the benefit of the instruction thus given, on the drawing which follows."

ILLINOIS LEGISLATION FOR VOCATIONAL EDUCATION.

The Illinois legislature, in its session of 1919, passed four important measures on vocational education.

(1) One law accepts the provisions of the Federal Vocational Education Act and creates a State Board for Vocational Education, defining its powers and duties and naming the State Superintendent of Public Instruction as its executive officer. This law passed early in the session with an emergency clause.

(2) A section of the omnibus bill carries an appropriation from the State Treasury for vocational education of $400,439.97 which added to the Federal allotment places under the control of the State Board a total of $800,879.94 for the biennium.

(3) The compulsory school attendance law was amended by providing that "in all districts where part-time continuation schools are established all children in employment between 14 and 16 years of age shall attend such continuation schools for at least eight hours each week during the period such schools are in session."

(4) The fourth law requires school authorities under certain conditions to establish part-time continuation schools for minors in employment between 14 and 18 years of age and requires such minors to attend such schools. It goes into effect in September, 1921, for the ages 14 to 16, in September, 1922, for the ages 14 to 17, and in September, 1923, for the ages 14 to 18. The establishment of part-time continuation classes is compulsory upon school authorities in those districts only in which there are twenty or more minors of the ages specified who are not in regular attendance upon all day schools. Attendance is required for not less than 8 hours per week for at least 36 weeks each year between the hours of eight o'clock in the forenoon and five o'clock in the afternoon on regular business days except Saturday afternoon.

By the provisions of the first two laws above, the State Board for Vocational Education is able to give financial aid to local school authorities for approved vocational courses in agriculture, home economics, and trades and industries, in full-time, part-time and evening classes. Approved training courses for the preparation of teachers of agricultural subjects, home economics subjects, and trade and industrial subjects may also be aided by the state board.

The third and fourth measures above provide for the gradual inauguration of a state-wide system of compulsory part-time continuation schools. During the next two years (until September, 1921) no school district *is required* to establish part-time classes, but any school district may secure compulsory part-time classes by the mere act of establishing part-time classes. After the classes are established, attendance is by state law compulsory for all minors in employment between 14 and 16 years of age.

Beginning in September, 1921, part-time classes for the age-group 14 to 16 *must* be established in all school districts in which there are at least 20 minors of such age who are not attending full-time schools, and attendance is by State law compulsory for all such minors. The upper age limit is gradually extended to 18 years in September, 1923, and as this is done it is obvious that more and more school districts will be included in which there are at least 20 minors of the ages specified.

In the above part-time classes, any one or any combination or all of the following subjects may be taught:

"(a) Those subjects usually taught in the public schools, so as to permit the students in the continuation school classes to continue their education from the point where they left it to go to work;

"(b) Civic and vocational subjects;

"(c) Those subjects which supplement the daily occupations of the students."

The State Board for Vocational Education will grant financial aid for the salaries of teachers of all of the above subjects in approved part-time classes.

The members of the State Board for Vocational Education are: Chairman, Francis W. Shepardson, Director of Registration and Education; Executive Officer, Francis G. Blair, Superintendent of Public Instruction; Charles Adkins, Director of Agriculture; William H. Boys, Director of Trade and Commerce; Barney Cohen, Director of Labor.

The members of the supervisory staff of the State Board are: E. A. Wreidt, Supervisor of Industrial Education; A. W. Nolan, Supervisor of Agricultural Education, James E. Hill, Assistant Supervisor of Agricultural Education; Cora I. Davis, Supervisor of Home Economics Education.

An Assistant Supervisor of Industrial Education will soon be engaged.

A bill has passed both houses of the Wisconsin state legislature raising the vocational school age to eighteen years.

Reorganization of the educational work in the California reform schools with less attention to the ordinary elementary school study and more to vocational training will be made by the state board of control, according to Marshall De Motte, chairman.

Mr. De Motte and F. C. Nellis, superintendent of the Whittier reform school, are planning vocational courses to be taught in the three state reform schools.

"Our object," said Mr. De Motte, "is to fit the boys and girls who leave our institutions to earn an honest living. We will consider not only ordinary school work, but systems of teaching vocational subjects. All will be standardized and organized to conform to one plan."

The state reform schools never have been organized educationally, according to Mr. De Motte.

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

A DRAWING CASE.

Mose E. Baker, Des Moines, Ia.

In order to meet the problem of lack of equipment in a small high school, the drawing case pictured here was designed. This enables the boy to take his drawing work home in the evening, besides it furnishes a safe and convenient place for his equipment. The upper chamber or compartment is for the drawing paper, triangles and Tee square, while the lower compartment is for ink, drawing instruments, etc.

The case is very light and easy to handle, is placed in an upright position when used, the front is let down, using the inner side for the drawing. Exclusive of the drawing board, which may be any size, this case can be made in any manual training shop for 75c.

Bill of Material.

Lumber, Pieces	Dimensions	Use
1	¾"x20"x24" drawing board	Front
1 Cypress	¾"x2"x24"	Front
2 Cypress	¾"x3"x22"	Sides
2 Cypress	¾"x2"x22½"	Ends
1 Cypress	¾"x2"x22½"	Partition
1 Wall Board	¼"x22"x24"	Back

A BELT SANDER.

F. W. Barnett, Wakefield, Mich.

Almost every shop feels a need now and then for a belt sander, but when the price and room are considered the need is quickly forgotten. We felt this need very keenly in our shop when it came to the scraping and sanding of 28 table tops, so with the help of the machinery department of H. Channon & Co., the manual training boys and myself rigged up a belt sander which does the work required of it in a first class manner. The cost of the entire machine was $32.00.

The driver pulley was fastened to a 12" American

WANTED: THE "BEST" OF PROBLEMS

What have been the most effective problems and projects made in your classes? Why have they been successful? In what way have they been best?

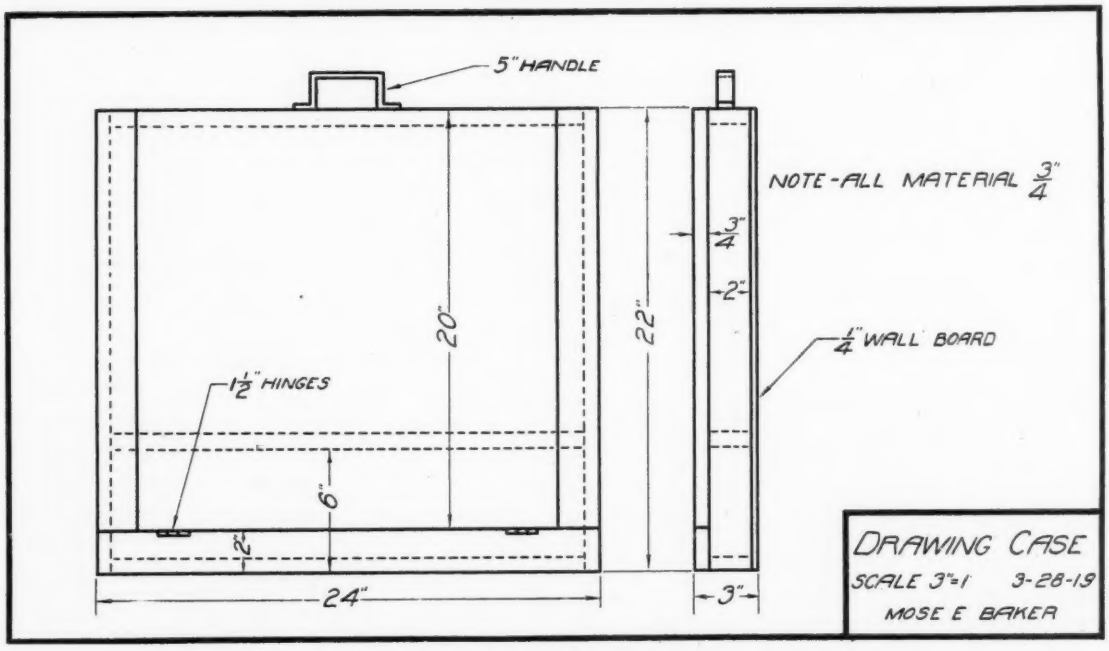
THE INDUSTRIAL-ARTS MAGAZINE is interested to learn what problems instructors consider their "best" and to publish a selection of those received in the Problems and Projects Department during the coming six months. For the "best" each month a check of $10 will be sent; for the second best, $7; and for all others, space rates will be paid. Problems will be judged on the basis of technical excellence, educational value, originality, utility, design, finish, beauty, economy. The editors of the Magazine will be the judges.

All problems submitted should consist of a black-and-white working drawing, or a tracing, a description of not more than 300 words, and if convenient a photograph. The description should include a statement of the particular points which made the problem successful and such details as are needed to make the construction and finish of the article intelligible to shop teachers.

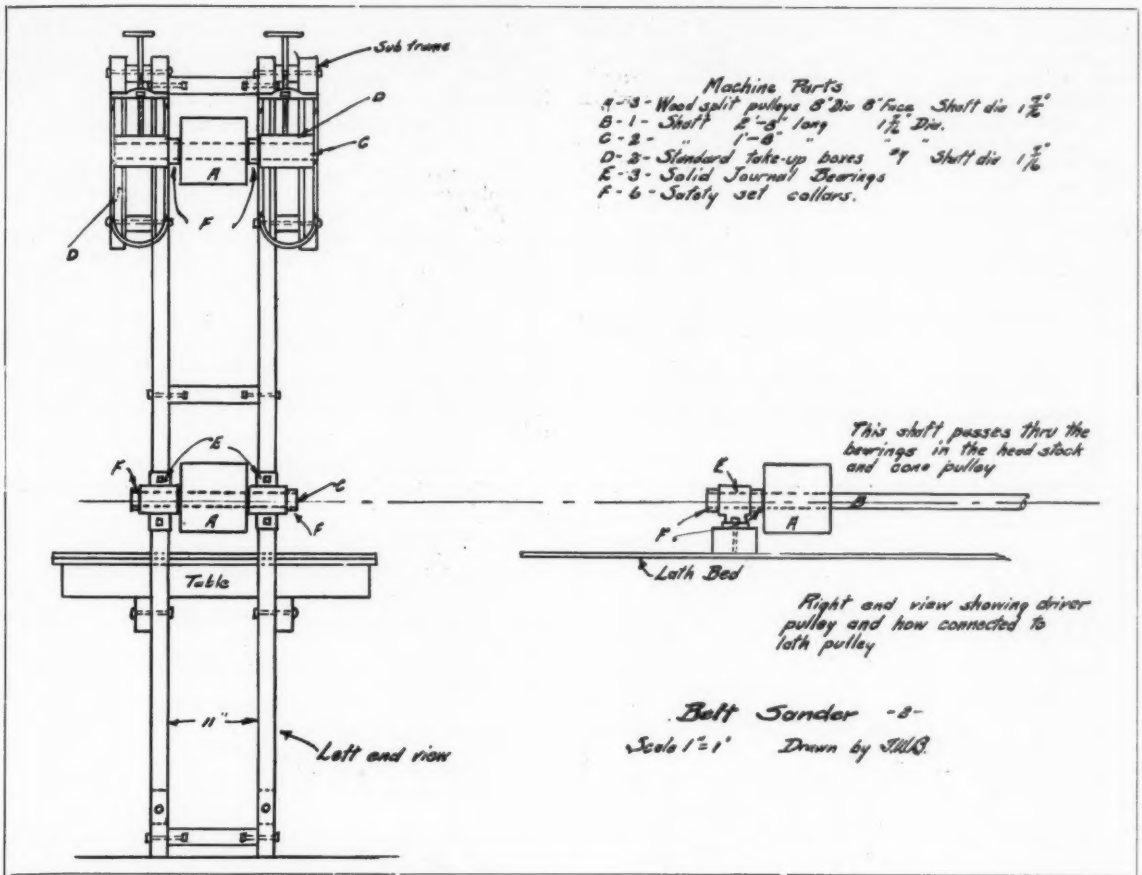
Problems in bench work, machine shop, patternmaking, cooking, sewing, millinery, forging, basketry, book binding, printing, leather work, pottery, cement work, cabinet making, woodworking, etc., are acceptable.

Problems may be submitted at any time up to December first, and any person may send as many as desired.

Address all correspondence to Managing Editor, **Industrial-Arts Magazine,** 129 Michigan Street, Milwaukee, Wis.



DETAILS OF DRAWING CASE.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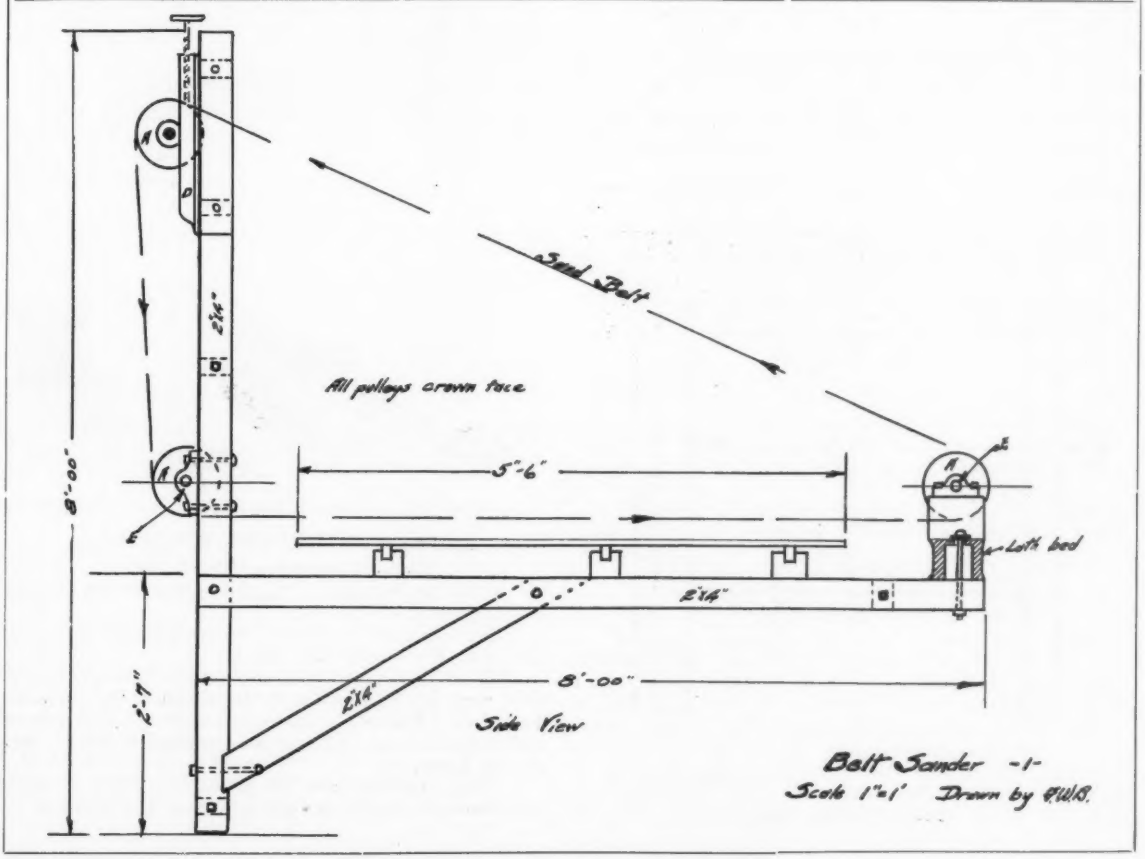
Left end view
Machine Parts
A-3 - Wood split pulleys 8" Dia 6" Face Shaft dia 1 7/16"
B-1 - Shaft 2'-8" long 1 7/16" Dia.
C-2 - " 1'-6" " " "
D-3 - Standard take-up boxes for Shaft dia 1 7/16"
E-3 - Solid Journal Bearings
F-6 - Safety set collars.
This shaft passes thru the bearings in the head stock and cone pulley
E
B
A
F
Lath Bed
Right end view showing driver pulley and how connected to lath pulley
Belt Sander -2-
Scale 1"=1' Drawn by H.W.B.


Sand Belt
All pulleys crown face
8'-00"
2'-7"
2"x4"
5"-6"
Lath bed
2"x4"
8'-00"
2"x4"
Side View
Belt Sander -1-
Scale 1"=1' Drawn by H.W.B.

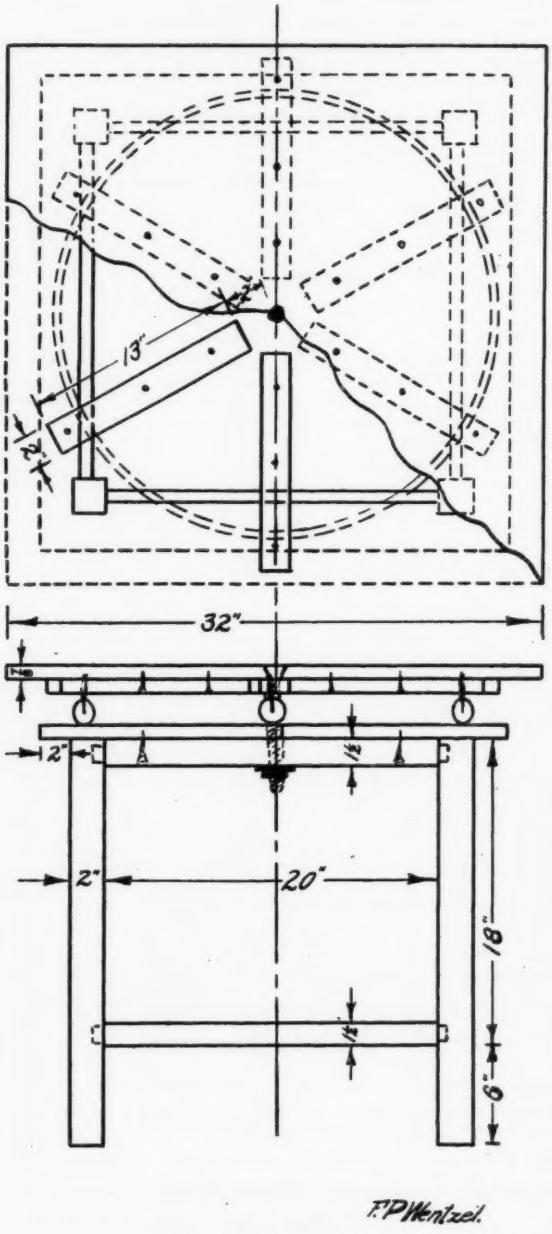
its place a shaft 2′ 8″ long with a bearing at the end bolted to the lathe bed. The two driven pulleys were fastened wood lathe by taking out the regular shaft and putting in on a frame made of oak 2″x4″ well bolted together which was again bolted to the lathe bed underneath.

In order to tighten the belt, two 7″ take-up bearings were used for the top pulley at a cost of about $4 a piece. The total cost of the machine parts was $27.00.

Only a few of the main dimensions are shown on the drawing and a variation in these might be made to suit conditions. The sanding table might be made to shift back and forth and of a size best adapted to the local needs.

A number of things can be used to bring the sand belt in contact with the surface which is to be finished.

Revolving Staining Table



Details of Staining Table.

We have used a stiff brush and a well padded hand block. The sand paper belt can be secured thru any hardware merchant. We happened to have only the 24″ width on hand so this was cut into three 8″ strips.

A REVOLVING STAINING TABLE.

Frank P. Wentzel, Clearfield, Pa.

The accompanying drawing illustrates the details of a revolving staining table which many schools will find useful. The writer has found it of use in sanding, painting and polishing, as well as staining pedestals, small tables, desks, etc., which must be handled several times to properly reach all the surfaces. The revolving table practically eliminates handling.

The table is constructed with mortise and tenon joints, and the top is fastened with screws or angle irons. The revolving top turns on castors. The distance between the table top must be adjusted according to the size of the castors used. The revolving top is held in the center by a bolt.

DOLL BED.

H. G. Schumacher, Detroit, Mich.

This problem worked out very successfully with ungraded boys using—

Planing jigs for making the pieces,

Sawing jigs for lengths,

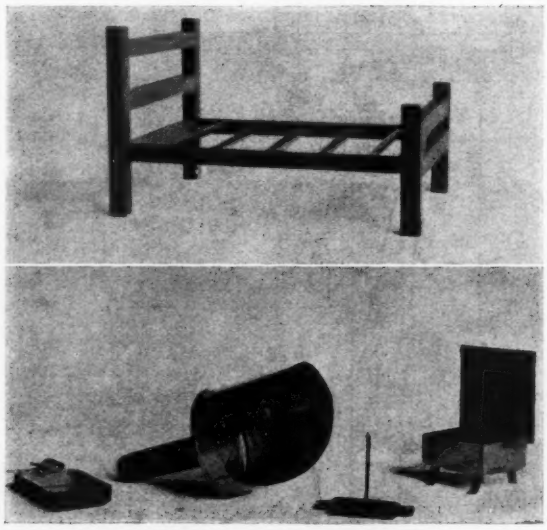
Assembling jigs for back—front and side rails.

Before assembling all joining ends were sized with glue. The ends then were recoated and fastened with one 1½″ brad.

In the seventh grade the boys used this problem; but without the aid of jigs:

Bill of Material.

2 Side Rails ⅝″x⅝″x9½″.
5 Front and Back Rails ⅝″x⅝″x6½″.
2 Front Posts ⅝″x⅝″x4″.
2 Back Posts ⅝″x⅝″x6½″.



(Above) Doll Bed. (Below) Ash Tray and other Sheet Metal Problems

METAL CUTTING AND SOLDERING.

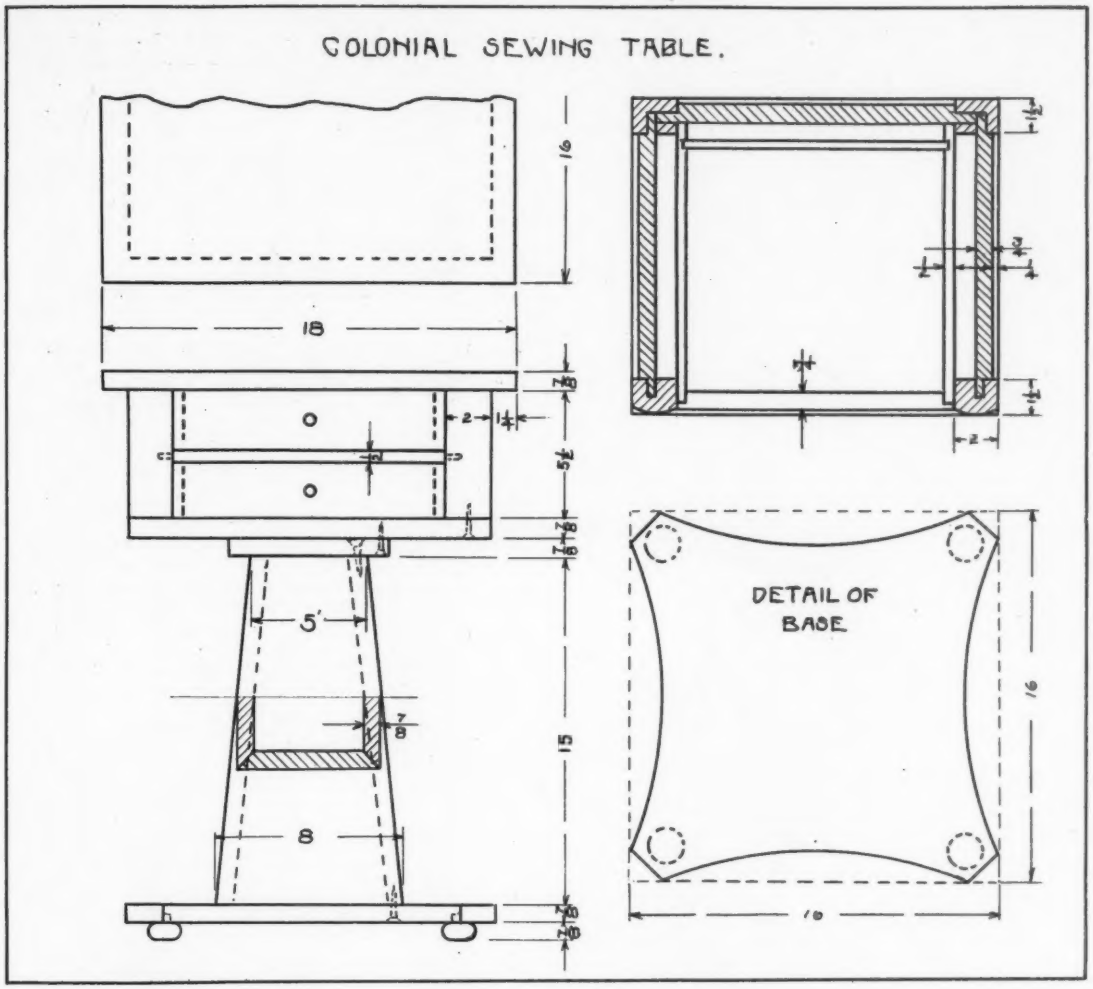
H. G. Schumacher, Detroit, Mich.

All of the problems in the photograph have been made from old cans.

The scoop has a wooden handle fastened to the can with a R. B. H. screw 1½″ No. 10.

The small "Dresser Box" at the right of the photograph looks very well when made in the octagonal and rectangular shapes. The box is lined with felt and then painted with a metal paint. The cover is soldered to the box with a small hinge.

These problems give the grade boy, work in laying out pattern in metal cutting, soldering, and shaping.



DETAILS OF COLONIAL TABLE.

COLONIAL SEWING TABLE.

J. C. Reynolds, Fredonia, N. Y.

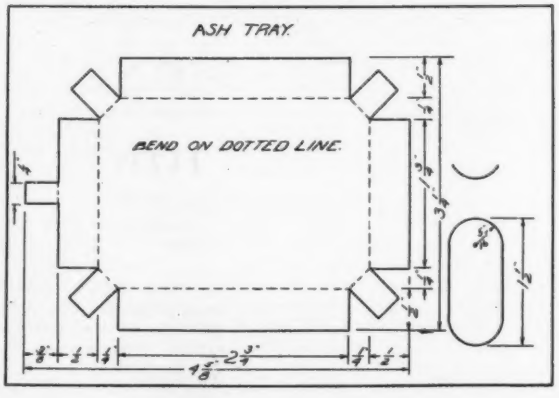
The design of the table shown in the drawings was taken from a colonial table, many well-preserved types of which may be found today. In nearly all of this furniture of early New England there is an exquisite simplicity giving it a permanent artistic value.

Some details of construction have been varied to adapt the piece to the school boy's capabilities but properly made it should last as long as its prototype whose age is testimony of its excellent construction.

Of course the wood used in the original was mahogany but figured red gum with its delicate grain markings has been a favorite with our students. The gum also takes kindly to stains if the builder does not care for the natural color of gum wood. Any close-grained cabinet wood is satisfactory. If gum is used its tendency to warp must be taken into consideration and the parts properly fastened to prevent this.

The working drawing will show the construction. The order of assembling is important because the screws should be hidden. This order will be obvious to the builder. The feet were turned on the lathe and doweled to the base.

A varnished finish is best adapted to this type of work. Glass knobs and plenty of rubbing will give you a pleasing result.



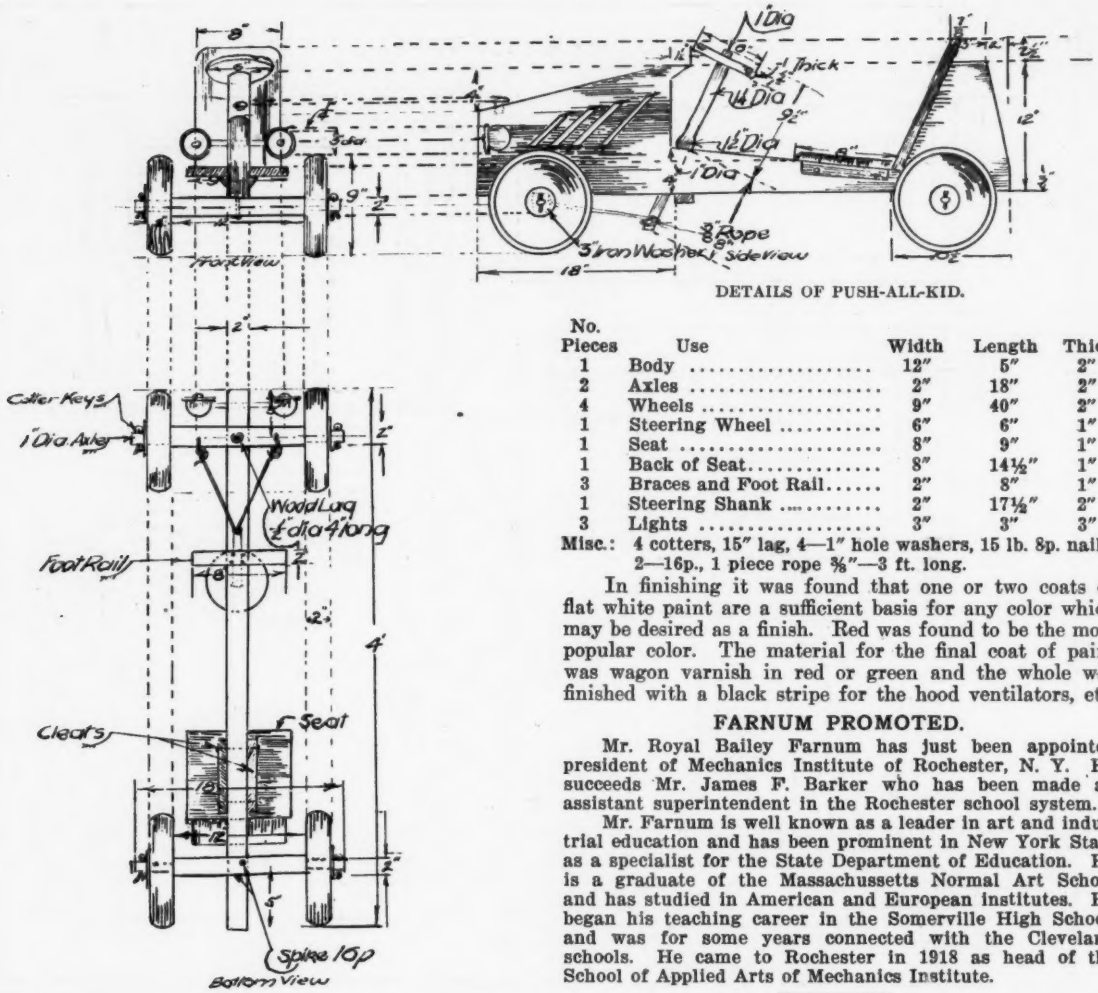
Details of Ash Tray.

PUSH-MOBILE.

A. D. Sloan, Supervisor of Industrial Arts, Great Bend, Kans.

The accompanying drawing illustrates a problem which has been immensely popular with the writer's students. A considerable number of these cars were made in the fall of 1918 for the Red Cross bazaar conducted by the students of the Great Bend schools. It has given satisfaction both in wear and as a shop problem.

In turning out quantities the boys in the first year turning classes made the wheels, axles, and hubs. The first year class in bench work cut out the bodies and seats



DETAILS OF PUSH-ALL-KID.

No. Pieces	Use	Width	Length	Thick
1	Body	12″	5″	2″
2	Axles	2″	18″	2″
4	Wheels	9″	40″	2″
1	Steering Wheel	6″	6″	1″
1	Seat	8″	9″	1″
1	Back of Seat	8″	14½″	1″
3	Braces and Foot Rail	2″	8″	1″
1	Steering Shank	2″	17½″	2″
3	Lights	3″	3″	3″

Misc.: 4 cotters, 15″ lag, 4—1″ hole washers, 15 lb. 8p. nails, 2—16p., 1 piece rope ⅜″—3 ft. long.

and did the assembling. The boys in the upper grades could do all this work and do it well.

The body of the car is made of pine 2″x12″x5′. The steering shank is made of oak and is wound on principal of "steam traction engine, i. e. the rope from the left axle is wound around the steering shank to left, from right to right ⅜″ rope is used. The wheels are protected with iron washers and cotter pins. To hold them in place the front axle is held to the frame by a 5″ wood lag screw washer to serve as a king bolt. The rear axle is fastened with two 16p. spikes. The foot rail is placed in position according to the size of the child. The bill of material is as follows:

In finishing it was found that one or two coats of flat white paint are a sufficient basis for any color which may be desired as a finish. Red was found to be the most popular color. The material for the final coat of paint was wagon varnish in red or green and the whole was finished with a black stripe for the hood ventilators, etc.

FARNUM PROMOTED.

Mr. Royal Bailey Farnum has just been appointed president of Mechanics Institute of Rochester, N. Y. He succeeds Mr. James F. Barker who has been made an assistant superintendent in the Rochester school system.

Mr. Farnum is well known as a leader in art and industrial education and has been prominent in New York State as a specialist for the State Department of Education. He is a graduate of the Massachussetts Normal Art School and has studied in American and European institutes. He began his teaching career in the Somerville High School, and was for some years connected with the Cleveland schools. He came to Rochester in 1918 as head of the School of Applied Arts of Mechanics Institute.

The sum of $14,000,000 is provided for the reeducation of disabled soldiers and sailors in the Sundry Civil Appropriation Bill signed by President Wilson on June 19. The original bill provided six millions to be placed at the disposal of the Federal Board for Vocational Education but the President returned it to congress with a request for the amount granted.

The Illinois state vocational education commission will spend approximately $200,000 in the coming year, according to plans outlined at its recent annual meeting in Springfield. The legislative biennial appropriation for this work is $400,439 and is to be matched by a similar sum by the federal government. E. A. Wreidt, vocational supervisor, was reelected secretary of the commission.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Stain for Gum.

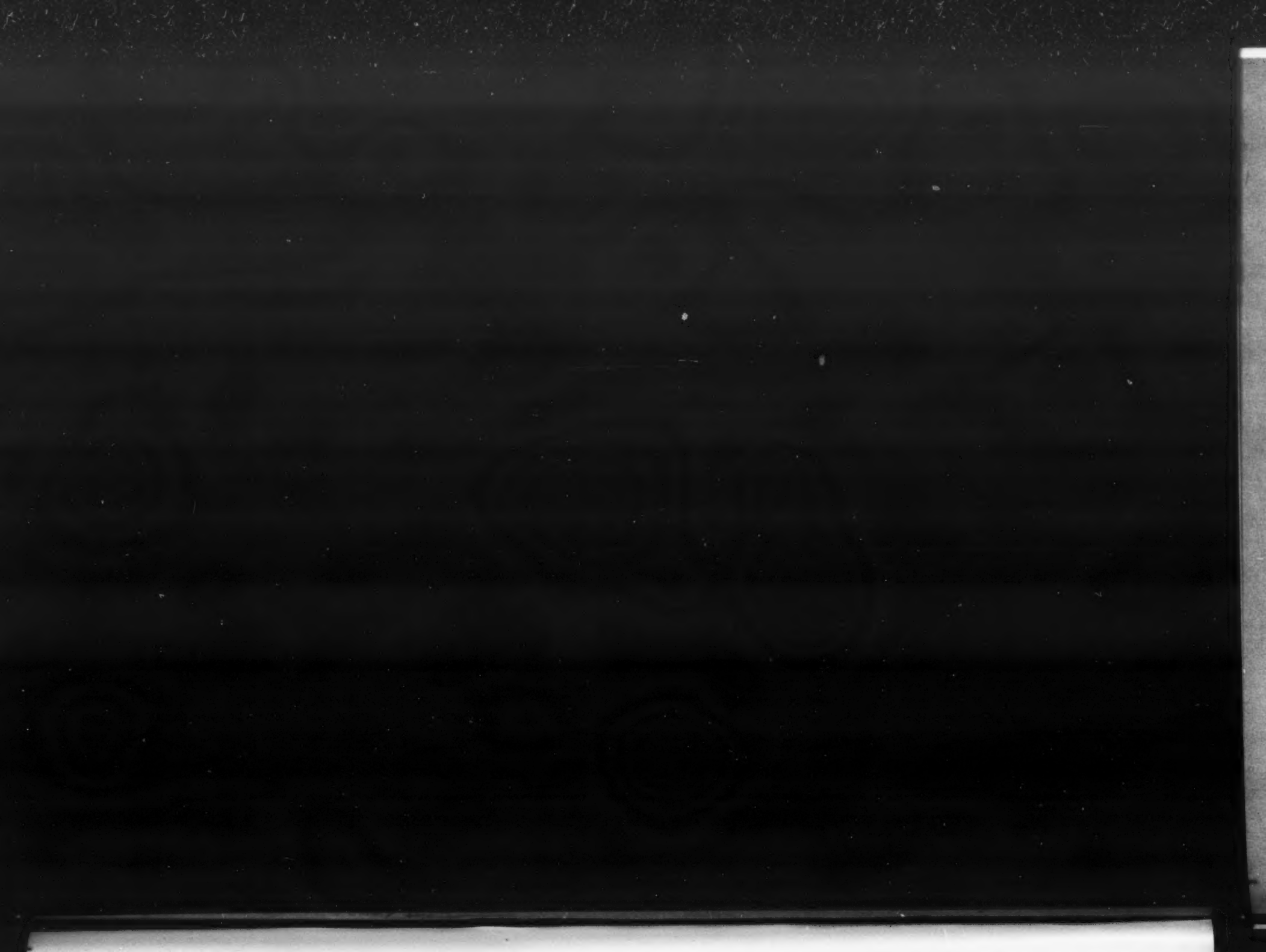
851. Q:—In your issue of April, 1917, in answer to question No. 580, you give the following formula for a walnut stain on gumwood.—*E. H. J. R.*

Dissolve in hot water 5 oz. walnut crystals, ¼ oz. black P. B. and ⅛ oz. potash.

What does P. B. mean and where would I obtain it and also the walnut crystals, thru a druggist or a paint supply house?

A:—P. B. is Pluto Black. It is best bought from a house which specializes in stain materials for wood finishing.

Smith-Hughes Law.

960. Q:—I have just returned from the army and want to get information on the Smith-Hughes Law.—*J. B.*

A:—The above question has come to us from various teachers who have been in the service. Complete details concerning the law may be had from the Federal Board for Vocational Education. Pamphlets on various aspects of the law are available. It is well to specify in what phases the inquirer is most interested. Local state supervisors have also issued bulletins, courses and circular letters and these are frequently of value in developing local plans.